Collier's for January 9, in Two Sections. *Section TWO*

5¢ a copy

Jan. 9, 1915

Collier's

THE NATIONAL WEEKLY

Automobile Section

Beginnings of the Automobile

By Peter Clark Macfarlane

DODGE BROTHERS
MOTOR CAR

You have been justified in expecting more than the ordinary measure of value from Dodge Brothers' experience and equipment.

These specifications indicate to what extent your expectations are realized.

UNIT POWER PLANT—Aluminum Cone Clutch—Leather-faced.

MOTOR—Four-cylinder, cast en bloc with removable head. 3⅞-inch bore by 4½-inch stroke, 30-35 H. P. Water Cooled. Centrifugal Pump.

RADIATOR—Tubular Type.

STARTER GENERATOR—Single unit. 12-volt, 40-amp. Battery.

HIGH TENSION MAGNETO—Waterproof. Eisemann.

LUBRICATION—Splash and force feed.

GASOLINE SYSTEM—Pressure feed. 15-gallon tank hung on rear.

REAR AXLE—Full-floating. Removable cover plate to give access to differential.

TRANSMISSION—Selective sliding gear type—three speeds forward and reverse. Vanadium steel gears, heat-treated.

TIMKEN BEARINGS thruout, including wheels and differential.

S. R. O. BALL BEARINGS in clutch and transmission.

STEERING GEAR—17-inch wheel. Irreversible nut and sector type.

DRIVE—Left side; center control.

WHEELBASE—110 inches.

BODY—Real five-passenger, comfortably upholstered in genuine grain leather with deep springs and natural hair.

SPRINGS—All Chrome Vanadium steel, self-lubricating.

FENDERS—Exceptionally handsome oval design.

RUNNING BOARDS AND FOOT BOARDS—Wood, linoleum covered and aluminum bound.

WHEELS—Hickory; demountable rims. 32 by 3½ inches.

TIRES—Straight side type—Non-skid rear.

WINDSHIELD—Rain vision, clear vision and ventilating.

TOP—One-man type, Mohair cover with Jiffy curtains and boot.

LIGHTS—Electric; head (with dimmers and automatic focusing device), tail and dash.

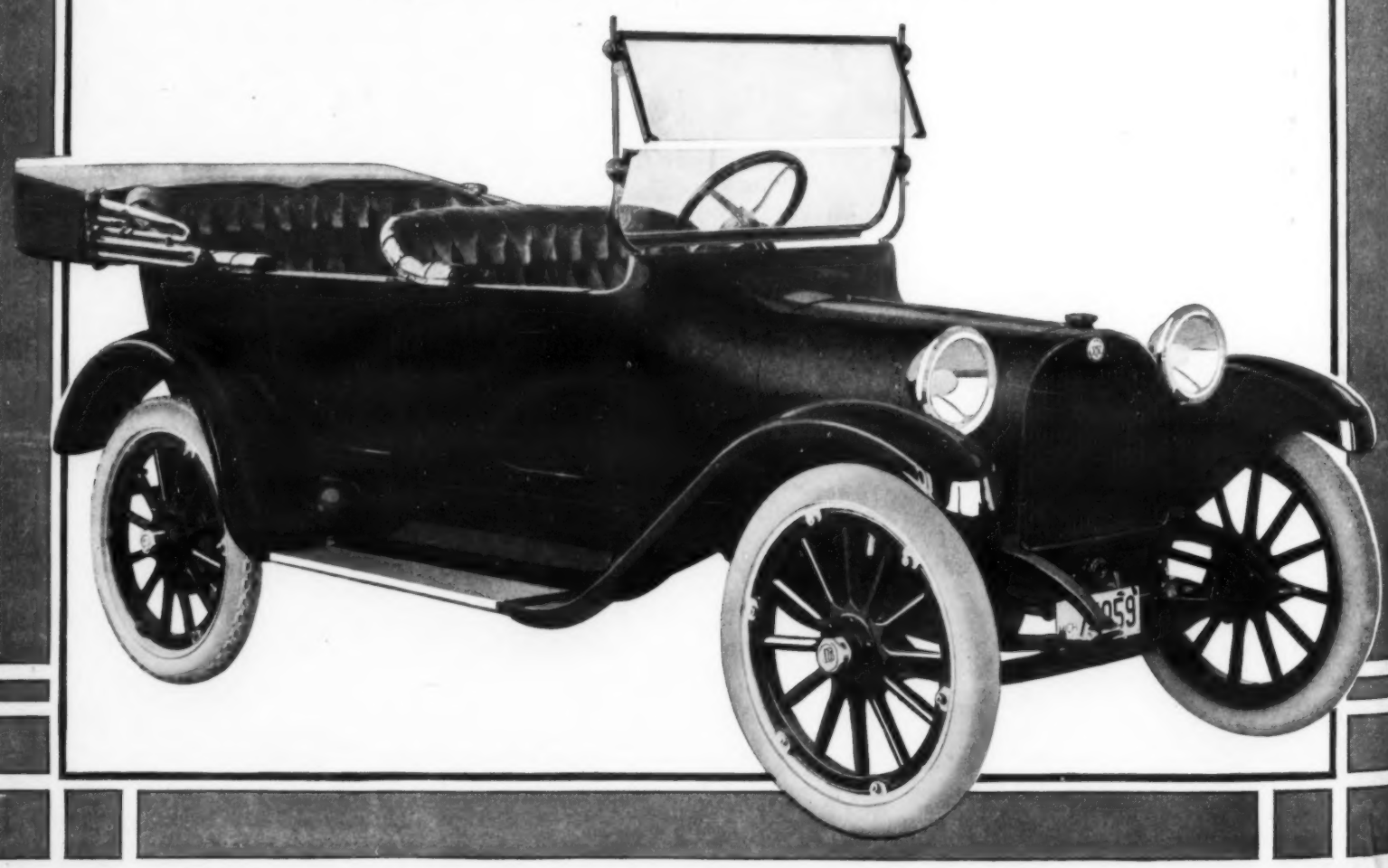
INSTRUMENT BOARD—Carries full equipment of oil pressure gauge, gasoline pressure gauge and pump, battery gauge, switches and speedometer. Speedometer driven from transmission.

EQUIPMENT—
Electric Horn — Robe Rail
License Brackets — Foot Rail — Tools
Demountable rim mounted on rear.

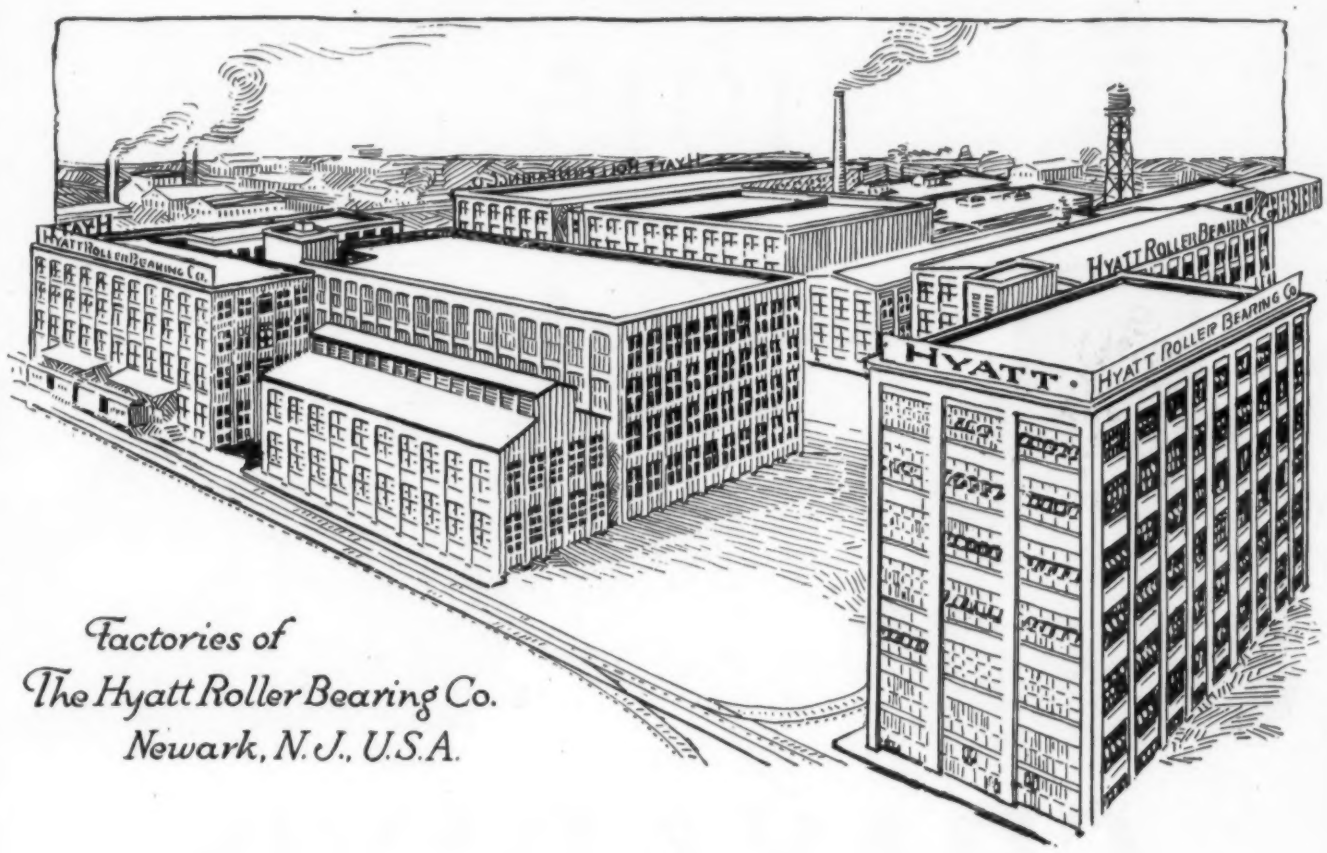
SHIPPING WEIGHT—
Approximately 2200 pounds.

PRICE—$785, f. o. b. Detroit.

DODGE BROTHERS, DETROIT



HY·FLEX·ROL



Factories of
The Hyatt Roller Bearing Co.
Newark, N.J., U.S.A.

SOME INSTITUTIONS REFLECT THE INTELLECT AND CAPABILITY OF A MAN AND THEY EQUALLY REFLECT THE GENERAL WEALTH AND PROSPERITY OF A NATION.

Prosperity and success are not the wish of a day, but the return for careful planning and thorough execution. There is a reward for constructive work—it makes small things develop bigness.

The Hyatt Factory has grown from a twenty-by-thirty-foot shed to a plant of four million feet of floor space, evidencing a development in consonance with the national prosperity.

There has been a real need, and a demand, for "Made in America" products. We know this from our own experience. A few years ago ninety per cent. of the bearings used in America were manufactured in foreign countries. Today, Hyatt has given this leadership to the United States.

By the hundreds and thousands, Hyatt Roller Bearings for Automobiles have penetrated to the hamlets and cities in this vast country.

Now, at this, the beginning of the New Year, we look forward to a greater degree of prosperity because conditions indicate that, as a nation, we exercise that fundamental of progress—discrimination.

"HYATT QUIET BEARINGS"

HYATT ROLLER BEARING CO.

DETROIT, CHICAGO
NEWARK, N.J.

ILLUSTRATIVE LITERATURE UPON REQUEST

The regulator-cutout is integral with dynamo. The regulator-cutout has two functions:

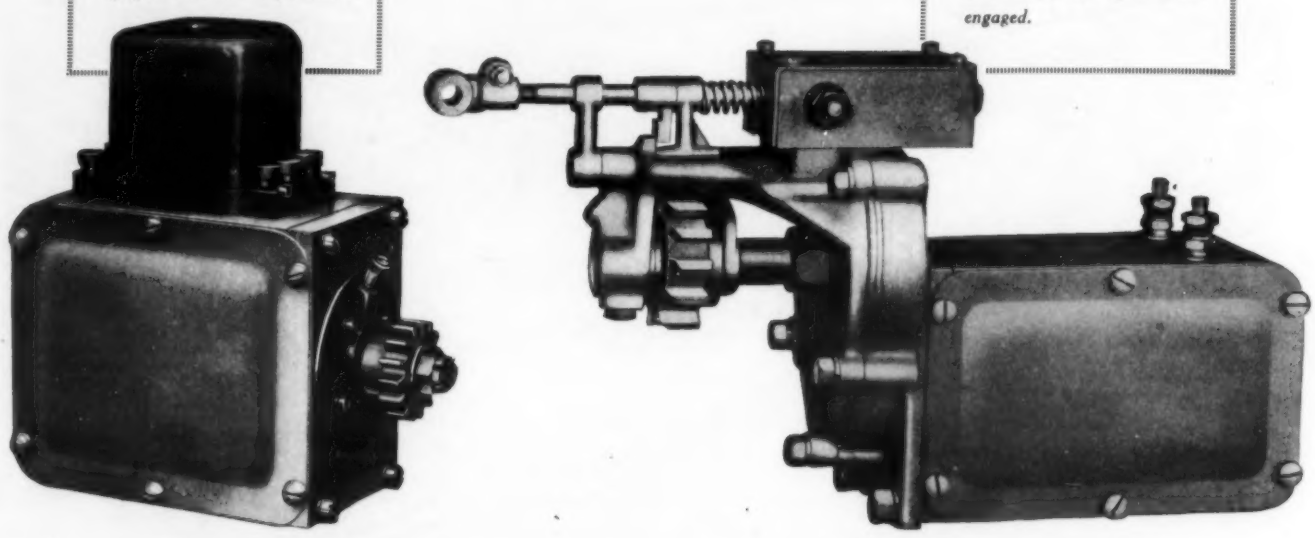
(1) to regulate dynamo so that battery receives the amount of current it requires.

(2) to control the opening and closing of dynamo circuit.

Bearings are in true alignment with field, resulting in perfect armature suspension.

The gear reduction design is unique and remarkably efficient. The starting switch ensures positive engagement with the flywheel — quietly, surely and smoothly. Neither the flywheel nor pinion gear teeth can be injured as the motor does not spin until engaged.

1915



GRAY & DAVIS

STARTING-LIGHTING SYSTEM

A Remarkable Advance in Electrical Equipment

For Ford Cars

We are now producing a Gray & Davis Starting-Lighting System for Ford cars.

This system can be quickly installed in any new or used model T by any garage or mechanic. The engine remains undisturbed. The system is compact, light in weight, and entirely hidden under the hood.

Without doubt the greatest convenience ever produced for the Ford Owner.

Write us for full particulars.

A GRAY & DAVIS dynamo and starting motor of the 1915 type are shown above.

Their difference is not merely a matter of appearance. They represent as well, important improvements which lift the efficiency of our former systems to a still higher plane.

The system as installed in different makes of cars varies somewhat to meet different specifications—but all installations are patterned after this general type.

The Magnet type of Frame

You will notice that these units have a rectangular or magnet-shaped frame. This frame is constructed of one flat piece of low carbon steel formed into a U shape. A piece of the same quality of steel is bolted across the end.

This innovation in frame construction gives the following distinct advantages over other forms of construction:

(1) The frame is more rugged and will stand the most severe service.

(2) It is more compact.

(3) Magnetic leakage from the armature is avoided, thus conserving the full power developed.

(4) Bearings are mounted in accurate alignment.

(5) Field pieces are absolutely true.

(6) The number of parts is materially reduced.

Accessibility

A notable feature of the 1915 type is its ready accessibility. By unscrewing the side plates, the interior is open for inspection or adjustment.

Lubrication

Convenient oiling places allow the lubricant to flow readily to all bearings.

Voltage

Our experience in building dynamos and motors has shown that 6 volts is the logical and economical pressure for automobile equipment. We do not require 12, 18 or 24 volts as is the case with some systems. A 6-volt battery means a genuine saving in battery weight, space and maintenance cost. We require but a small 3-cell battery, the same as that used for ignition.

Furthermore, the Gray & Davis dynamo and starting motor are designed to *conserve the life and strength of the battery*—a most important factor in the consideration of any electric system.

Wiring

The method of mounting the regulator-cutout and switch leads to a distinct reduction and simplification of wiring.

We will be glad to supply complete data on request. Any detailed questions will be fully answered by special letter.

GRAY & DAVIS, Inc., Boston, Mass.

VOLUME 54 NUMBER 17 JANUARY 9 1915

Collier's

AUTOMOBILE SECTION

Entered at the New York Post Office as Second-Class Matter

MARK SULLIVAN, EDITOR

Entered as Second-Class Matter at the Post Office Department, Ottawa, Canada

STAYING AT HOME FOR AWHILE

HOW THE EUROPEAN WAR SHOULD ENCOURAGE AMERICAN MOTORING

BY WALTER HALE

ILLUSTRATIONS BY THE AUTHOR

FOREIGN motor touring, for the time being, is as dead as Marley's ghost. The curtain on the pastime descended with a sudden bump on or about the early part of last August. Whether or not it will be raised for the season of 1915 would seem to depend upon events in Belgium and in Northern France, in the meantime. And also upon the Russian effort to invest Berlin.

When the situation became critical the usual number of American motorists were speeding over the roads of Europe with an unconscious effort to patronize the belligerent nations impartially. The impending war cloud was the signal for our exodus toward neutral ports that rivaled for excitement the rush along the Boston Post Road for the Yale-Harvard game.

But motor cars of all makes were needed by the different armies in the operations to come. It mattered little where you chanced to be—your American automobile was seized by the authorities, and no partiality was shown. Except that if you were halted in France and your name was Schmidt, Schultze, or Müller, you were surer of losing your car, without the satisfaction of an argument, than if you were just plain Smith, Jones, or Brown.

The picturesque inns of the Black Forest and the Tyrol, of the château country and the Normandy coast, are either closed or are being conducted by women and old men. The chef, the *garçon de chambre*—even the *chausseur*—are with the colors, and there would be no green-aproned porters to welcome us were we able to distribute largesse with the same abandon as before.

During the coming summer, and possibly others to follow, the "Seeing America First" propaganda will be given an unexpected impetus. We, who have been called expatriates and worse, because we extolled the beauties of the Tyrol and the Pyrenees at the expense of the White Mountains, and gave the châteaux of Loire a place above the Berkshires and the north shore of Massachusetts in historic interest, must stay at home, perforce, and become better acquainted with our own country. The fact that Senator and Mrs. Whoswho (forty horsepower Packard) have arrived at the Bernascon, Aix-les-Bains; that Mr. and Mrs. Thusandso (sixty horsepower locomobile) have left the Ritz for Deauville and the Normandy coast; that Prince and Princess Hasenpfeffer, née Smythe, of Pittsburgh (forty horsepower Garford) have crossed the Stelvio for a tour in the dual monarchy, will not for the present appear in the European cable news. Instead, their names will be added to others prominent in the social columns among the guests at Lenox, Bretton Woods, Bar Harbor, and Virginia Hot Springs.

Whether or not "Seeing America First" becomes a habit with us will depend on the extent to which it is made attractive.

Let us consider, then, the American hotel-keepers' opportunity. It is also the opportunity of the business man and the farmer, of the manufacturer and the shopkeeper. They should all profit through the great number of motorists whom the war has forced to stay at home for a while.

We have more than our share of "scenic wonders," and they have failed of their purpose if they do not leave you breathless and overcome with awe. But it would be impossible to include the Garden of the Gods, the Grand Cañon of the Colorado, the peaks of the Rockies and Cascades, the Spanish Missions of California, the Glacier and Yellowstone National Parks, and such extended tours in the short space of a single magazine article.

If France is the continental motorists' paradise, New England occupies the same beatific position in America. For purposes of comparison, then, let us take a tour from New York through the White Mountains and along the Atlantic seaboard on the one hand, and from Paris, around France, to the Mediterranean and back on the other.

Through Westchester County, the Berkshires, the Green Mountains, past Lake Champlain and Bretton Woods, and along the coast back to New York is a comprehensive journey of about one thousand miles. From Havre to Paris, then south in a broad sweep to the Pyrenees, the Mediterranean, the Maritime Alps, and back through the Rhone Valley and the Côte-d'Or district is an equally popular tour in France—the distance is some six hundred miles longer.

Since roads play such an important part in planning a motorist's itinerary, they should be given attention first. France has, admittedly, the finest system of highways in the world—due primarily to the genius of the first Napoleon. They were planned as military roads—trunk lines running out of Paris like the spokes of a wheel, and affording direct communication between the important centers and the capital. They are constructed in the most durable fashion with a stone base and careful provision for drainage. If a hill stood in the way, it was cut through or graded; if a stronger bridge was needed, it was built. Trees were planted on either side to afford protection from sun and wind, and, when the mountains had to be crossed, the road looped itself up to the summit with the aid of a series of embankments and retaining walls constructed with the same thought for the gradients that our engineers would give to planning a railway at home.

The immense value of these military roads has been proved in the present crisis. Affording a perfect surface for motor traffic, they have simplified the problem of keeping open the lines of communication; they have made possible the quick handling of munitions, and added to the efficiency of the hospital service. Above all, they have greatly aided the mobility of the allied troops—when the lines weakened, reenforcements have been rushed to the spot in motor trucks and busses.

Widely different conditions prevail on the tour through New England. There has been a great improvement in the roads of Westchester County, Massachusetts, and New Hampshire in the last ten years. But the general result is still uneven. We leave the good road from New York to find some bad going in northwestern Connecticut, and the excellent route through the scenic loveliness of the Berkshires gives way to some shocking dirt road after we cross the State line into Vermont.

The "Peru Turnpike"

Motoring through picturesque Germany: a gateway of medieval Rothenburg on the Tauber in Bavaria

A typical American resort hotel in the unparalleled Berkshires—the Aspinwall, at Lenox, Mass.

over the Green Mountains after leaving Manchester is an example of the ante bellum country road at its worst. It is reminiscent of the late fifties because of the tollgate, where a grim-visaged guard exacts a fee of fifty cents from the suffering motorist for the privilege of jumping from bump to bump over this antiquated pass like the agile chamois. Two years ago I drove my car over twenty of the higher Alpine passes—with a total altitude of over one hundred thousand feet above the sea. With the exception of the hairpin corners on the upper part of the Stelvio, which is the highest carriage road in Europe, there was less demand upon the car and the driver in all this "collar work" than in the single journey over the "pass" in the Green Mountains.

The best of the new roads compare favorably with Napoleon's. The New England tour carries us through some of the most romantic and interesting localities in the United States

The turnpike is on what has been extensively advertised by a group of hotel men as the "Ideal Tour," which lends color to the impression that the primary object of the itinerary is achieved when the patrons are routed from one of the hotels on the circuit to the other. "Peru Mountain Pass has been much improved as to grade," if we can believe the enthusiastic innkeepers. But if it was ever in a more shocking condition than during last September, it is a lasting proof of the futility of privately owned roadways. The Vermont Legislature has endeavored to buy the franchise, but the owners know a good thing when they see it—and the motorist pays the freight.

New Hampshire roads have been wonderfully bettered, particularly through Pinkham and Dixville notches, and from Bretton Woods to North Conway, Portsmouth, and Boston. In Maine, from the foothills of the mountains to the coast, short sharp hills, deep ruts, and a yielding surface of sand or dirt prevail. But the automobile associations are working for better conditions, and an earnest of what may be expected eventually all over the State will be found in the well-built highway from Portland through Biddeford to the Piscataqua River, near Portsmouth. Back again in Massachusetts, a beautiful parkway system reaches out from Boston and sweeps you along near the ocean from Swampscott to the city.

From Boston to New York, via Taunton, Newport, and New London, is a slightly shorter route than the famous Boston Post Road by way of Springfield and Hartford. The two ferry crossings near Newport, and another at New London, are a drawback overcome in a measure because not so many large towns are encountered on the shore-line route—the roads are stoutly built and surfaced to withstand the increasing traffic by automobile.

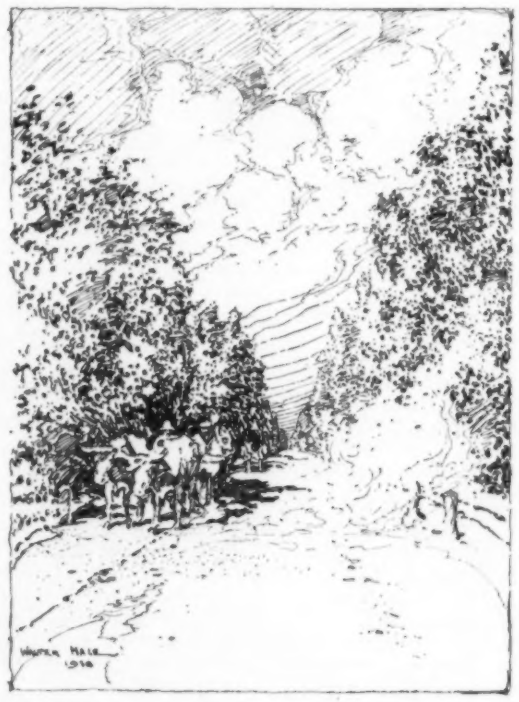
On the popular itinerary I have outlined, then, we can hardly look for the same unchanging stretches of splendid highway we find on the circular tour in France. The best of the new roads compare favorably with Napoleon's *Routes Nationales*—the others would be marked "very bad" or "very dangerous" in the French guide books. Crossroads and forks in New England are as carefully signposted as those in Europe. They are sometimes too carefully marked, in fact. At one sharp turn in Vermont we were warned against a grade crossing by signs of the A. A. A., the A. C. A., the State automobile association, a local hotel, two makes of tires, an automobile signaling device, and the railway itself. The beautiful landscape in France is not unfrequently disfigured in the same way. Advertising signs that may confuse the driver should be abolished by law, and dangerous crossings, sharp turns, and road directions marked only by the local authorities or the automobile associations.

Old Memories and New Inventions

LEVEL railway crossings have largely disappeared in the neighborhood of the big cities. But there are many of them in the open country throughout New England. Hidden behind trees or walls, in ravines or beyond short hills, they are a constant menace, and the fact that serious accidents are not more common is remarkable. Here again we must turn to France as an old-time exponent of the theory of "safety first." There are grade crossings in France, but they are always guarded by gates and flagmen, and are so infrequent in some districts that on a recent tour I motored for the better part of two days through the southern provinces before I found one near Carcassonne to use as a motion-picture background.

The confirmed speed maniac cares little for the historic associations of the towns through which he sweeps in his effort to get from somewhere to somewhere else. But the New England tour carries us through some of the most romantic and interesting localities in the United States. Fort Lee and Fort George are identified with the operations of the Continental army, and Washington pressed his courtship in the old Phillipse Manor at Yonkers. Tarrytown is associated with Washington Irving and Major André; Hawthorne, Holmes, Longfellow, and Fanny Kemble are connected with the towns in the Berkshires. At Williamstown the college was founded in 1793, and across the Vermont State line, at Old Bennington, a monument commemorates the defeat of the British under Colonel Baum by Stark and his Green Mountain Boys. A stone by the roadside beyond Rutland marks the site of Fort Vengeance, and at Vergennes—one of the oldest towns in Vermont—Commodore McDonough's fleet was fitted out for the battle of Lake Champlain. Across the lake, at Ticonderoga—"Fort Ti" they call it locally—Ethan Allan surprised the British commander with his demand for the surrender of the stronghold "in the name of the Great Jehovah and the Continental Congress."

The towns along the Atlantic seaboard are all closely identified with the country's early history. Portland, founded in 1632 and first called Casco and afterward Falmouth, occupies the site of the old town destroyed by the British in 1776. Daniel Webster brought his young bride to Portsmouth in 1808, and the famous old *Kearsarge* was built in the navy yard that now harbors our modern type of superdreadnoughts. Newburyport, "an ancient sea-blown city at the mouth of the Merrimac," is no longer the home of the privateers and the headquarters of a busy



The olive-shaded Via Emilia—near Modena, Italy

trade over seas. It has settled down to a prosaic existence as a cotton and boot and shoe manufacturing center, and the public library occupies the old house that once sheltered Washington and Lafayette. Gloucester has a dramatic history connected with its great fishing fleet, and Salem, once the haunt of privateersmen and with its East India trade only a memory, retains its "House of the Seven Gables" and the Customhouse identified with "The Scarlet Letter" despite the recent disastrous fire. Governor Winthrop landed at Salem in 1630, and at one time it was the capital of Massachusetts.

Boston's place in the history of the country and in the development of its literature and art is too familiar to bear repetition here. Newport has one old relic that more or less baffles the historians, but the ancient Round Tower that has been credited to the Norsemen and served for the inspiration of Longfellow's "The Skeleton in Armor" was more than likely the old Stone Mill referred to in Governor Arnold's will.

At Mystic is the Pequot Battle Monument, and on the eminence nearing New London is the obelisk commemorating the burning of the town and the massacre of Fort Griswold in 1781. Nathan Hale's schoolroom and the old town mill are in New London. Old Lyme and Guilford are quaint New England villages, and New Haven occupies a tender place in the memories of the "old grads" of Yale University. Norwalk was founded by the Indians in 1640, and Fairfield, at one time a stop for the stage coaches out of New York, was burned by the British in 1779. The British were particularly active along this part of the Post Road—from the spot where General Putnam eluded his pursuers by dashing down the rocks at Greenwich through New Rochelle and Pelham Manor to the Revolutionary battle fields in the neighborhood of New York.

So much for the historical points of interest along the motor highways of New England.

From the summit of each Alpine pass I climbed a year ago—the Petit St. Bernard, the Mont Cenis, the Stelvio, and others—I sent post cards to my nephew in Denver, expecting to impress him. His answer to this collection of souvenirs was a suggestion that I come out to Denver and see some real mountains.

Mountain Climbing by Motor

THE awe-inspiring glories of the Rockies and Cascades, I admit, are too unfamiliar as yet to Eastern motorists. But, try as I will, I cannot bring myself to see Crawford and Pinkham notches in comparison with the Gorges of the Tarn and Ollioules, and am unpatriotic enough to find a diversity of scenic outline in the Maritime Alps that I miss in the White Mountains. And at that I must admit that my first view of the sweeping plateau on which the great hotels of Bretton Woods lie, with a girdle of red-gold autumn foliage encircling the vast amphitheatre, and the peaks of Mount Washington and Mount Jefferson in the background dusted with snow after a crisp October night, gave me an unexpected thrill. But the approach is by way of a tree-bordered highway, and there are only occasional glimpses of the distant mountains before the summit is attained.

The ascent of Mount Washington, while not a pass in the strict sense of the word, is more satisfactory. You reach here an altitude of six thousand feet—the early part of the climb is again through wooded slopes, but the car finally rises above them. A splendid expanse of valleys and rocky ravines opens up, and there is all the exhilaration and excitement one associates with a motor ascent into high altitudes as the engine beats its way with a regular rhythm up to the summit.

The Corniche road along the Mediterranean from Marseilles to the Italian frontier is a bewildering panorama of ever-changing beauty for almost the entire distance. The highway along the north shore of Massachusetts in no way resembles the Riviera, of course. None of your palm and lemon trees, but maple, fir, and oak instead; none of your red-tiled villas above rose-capped walls; none of your iridescent mountains piling themselves in the background, and none of what the home-coming Englishman called your "damned blue sky." Instead, imposing country houses with hedges and well-kept lawns, rocky, windswept headlands, and the dull red and green of rolling moors with gray clouds overhead and vistas of white porticoes beyond long avenues of trees. This with a glorious absence of advertising signs to complete a drive not only unique in this country, but unlike anything I have encountered in my motor journeys in Europe.

Some years ago I saw the around-the-world race start from Times Square in New York. It was in the early winter, I think, and I wondered what the foreign drivers would have to say about our roads, our weather, and our hotel accommodations by the time they had beaten their way across the continent. Particularly about the hotels. You know the kind I mean. Not the modern fireproof building of the larger cities

. . .

where creature comforts are assured, but the hotel of the small town, with breakfast from six to eight, dinner from twelve to two, and supper from six to seven. If you're not in the dining room during those hours, b'gosh, not even a sandwich do you get. I could picture the imperious head waitress escorting these bewildered Frenchmen to their seats at table, to be followed by an equally important helpmate, who fires the menu at them in a verbal volley. If it was a "dry" town, I can only imagine the horror on the face of the waitress when the guests modestly asked for the wine of the country. I have never asked for the wine of the country in a dry town. And I could see these belated travelers arriving at night and skirmishing through the snowdrifts in search of the "Owl Lunch Wagon" or the depot restaurant while a disgruntled night clerk cursed them roundly for disturbing his slumbers.

In the White Mountains. "But I cannot bring myself to see Crawford's Notch in comparison with the Gorges of the Tarn"

On the reverse side of the picture I called to mind the numerous country inns on the Continent whereat I had arrived at unseemly hours to find a cheery welcome. The lights were turned up, and while madame foraged in the larder, monsieur produced a bottle from the cellar, and I was induced for the moment to forget tire troubles and refractory motors. They do these things better on the other side. In England the belated traveler who has come a distance of more than three miles is legally entitled to demand food or drink. On the Continent the same consideration is more likely the survival of old customs handed down from the days of the diligence and post chaise.

There is a similitude between the names of the old English coaching inns and those that front the highways in Europe. The "White Horse" becomes the "Cheval Blanc" in France, the "Crown" the "Kaiserkrone" in the Tyrol, the "Golden Lion" the "Leone d'Oro" in Italy. For quaint signboards there are the "Goat in Boots," the "Pig and Carrot," the "Falcon and Bear," and the "Five Loggerheads" in England; the "Trois Poissons," the "Pewter Pot" (*Pôt d'Etain*), the "Headless Woman" (*à la Femme sans Tête*), and the "Bon Laboureur" in France; and the "Four Pilgrims" (*Quattro Pellegrini*), the "Albergo de Muletto," the "Tre Garofini" (Three Gillyflowers), and "Tre Zucchette" (Three Cucumbers) in Italy.

Inns Here and There

IN AMERICA, the nomenclature of the roadside taverns patronized by our forefathers was equally picturesque. The old inns fell into disuse when the railway replaced travel by stagecoach and canal boat. But the coming of the motor car has brought new life to many of the former coaching taverns and there has been many a hunt through dusty garrets and lumber rooms in search of the swinging signs that formerly beckoned to the traveler on the turnpikes of New England and the Eastern States. The "Red Lion," the "Wolf's Head," the "Wayside Inn," the "Robin Hood," the "Royal James," again creak to and fro in the wind.

Not infrequently the signboards were the work of eminent painters—in some cases they were done by itinerant artists as a means of paying the reckoning. Hogarth, Richard Wilson, Ibbetson, and Millais in England; Holbein, Correggio, Watteau, and Paul Potter on the Continent, and Benjamin West, Pratt, Peale, and Gilbert Stuart in America are among those who, for one reason or another, have been associated with the production of ancient tavern signs. The only example of the work of a modern painter I found on my recent New England tour is the exquisite little sign of the "Tea Tray" by Maxfield Parrish near Cornish, New Hampshire.

As many of our taverns of the past were ancient manors that had seen better days, so some of the newer inns on the Connecticut and Massachusetts roads are old colonial homes reconstructed to serve the modern traveler by motor car. Take for example the beautifully decorated "Stonington Manor" near Stonington and the very imposing "Royal James" at Norwalk with its columned portico and old mahogany newel posts and stair railings. What if we miss the dormer windows and broken moss-covered tiles and picturesque courtyards of the old-time inns of France? Our rejuvenated posting inns have their own attractive atmosphere and the effort to make them as reminiscent of their past as possible should be encouraged.

Admitting that the cost of living is greater here than in Europe, and that we demand comforts in our own country that we would willingly forego while touring abroad, it is still hard to reconcile oneself to the great difference in prices. The tariff in the best hotels of Paris, London, Berlin, and New York varies very slightly. But the motorist naturally objects to paying similar charges in the smaller American cities. Outside of Paris, rates scale down perceptibly. Rooms in hotels of the first-class average from four francs (eighty cents) up, breakfast is thirty cents, luncheon without wine eighty cents, and dinner one dollar. In the smaller country inns the prices are much more reasonable and wine is almost invariably included. Special rates for the chauffeur are quoted in most of the Continental hotels—they vary from five to ten francs "en pension." All of which seems ridiculously cheap in comparison to what we have to pay in the small-town hotels at home. When a tariff for the chauffeur's luncheon or dinner is the same as your own, it is like giving a steamship company first-class fare for second-class accommodations.

How Frugal France Makes Good

THE difference in the cost of living between the hotels of France and New England is a most important item and there is small chance of the conditions changing. France is a frugal country, where nothing is wasted and the wealthy motorist is not ashamed to examine his bills carefully. We, on the other hand, rush madly from one place to another, arrive late and demand the best accommodations and few of us have the courage to argue with the clerk over the account in the morning. We would be taken advantage of more frequently were it not for the uniform scale of prices that prevails in most of our hotels. The whole trouble is that for various economic reasons it costs about twice as much to live in the United States as it does in the Latin countries of Europe.

If it is unreasonable to charge Waldorf or Ritz-Carlton prices in the hotels of Waterbury, Scranton, or Syracuse, where rents are cheaper and the service not so good, it is equally irritating to find that it costs as much to garage the car in a shanty or stable as it does in a fireproof building in a large city. There must be some sort of "Garage Union" that holds out for one dollar per night without washing. The innkeepers of France rarely charge for stabling a car overnight. They are too eager to cater to the increasing patronage arriving by automobile. If the courtyard is not available, a near-by garage shelters the car free to patrons of the hotel—if a fee is exacted it is seldom more than a franc.

One great point in favor of touring in America to offset the disparity between the cost of living here and in the Old World is the much lower cost for operating expenses. I have paid as low as ten cents a gallon retail for gasoline in New Jersey; and as high as $1.30 a gallon in Spain, $1.15 in Italy, and 60 cents in France—in Germany, Austria and England the price used to be a trifle higher than it is here.

Discounts of from 5 to 10 per cent are allowed to members of the Touring Club in many of the hotels, garages, and repair shops of France. And the hotel keeper who takes advantage of your unfamiliarity with the language to add a few extraneous items to the account can always be brought back to earth if you display your membership card in the organization. He had as lief lose his star in Baedeker as antagonize headquarters on the Avenue de la Grande-Armée.

This brings me to a comparison between our motor associations and the Touring Club of France, which includes hundreds of Americans among its members. It is the oldest organization of its kind and the most far-reaching in its influence. What it will be when the war is over I don't know—it has already suspended publication of its little magazine, the "Revue Mensuelle." But the fact remains that for twenty years it has agitated legislation, protected its members, completely posted the country even to the smallest *chemin de traverse* with road signs and signals, secured special hotel rates and discounts, aided in improving mountain highways and conducted a successful campaign for the installation of modern sanitary arrangements in the smaller inns of France. Its activities are not confined alone to motoring—it was started when the bicycle craze was at its height and it also encourages walking, camping, motor boating, and winter sports. It publishes complete and convenient maps and touring books and a comprehensive hotel guide not only covering France but also foreign countries. In the latter are the findings of the "Gastronomical Committee" enumerating the spécialités of each town—the wines, delicacies and the culinary triumphs for which the chefs of the neighborhood are noted.

For Better Cookery

NONE but a French touring club would appoint a "Gastronomical Committee." Nor, for that matter, would any other organization conduct a contest by which the "Laureates of the competition of Good Hotel Keepers" are determined by popular vote. And the diploma is not conferred without reason. The inn presided over by the "Laureate" is always a trifle cozier and the cuisine a great deal better than the general run of country hotels in France.

I am not sure that the average American hotel keeper would care whether or not his patrons rewarded him with a diploma. But it would look well framed between his association certificate and his liquor license.

If our motor clubs were slow beginning, they have made remarkable progress in recent years. The Automobile Club of America was the pioneer. It started as more or less of a social organization—on the lines of the Automobile Club of France. It has grown in influence and in numbers—it has a splendid building in New York with garage, technical department, touring bureau, and club rooms. It has appointed hotels, published touring maps and its signposts are familiar on Eastern highways. In spite of these activities, its influence is largely local—its membership is drawn principally from New York and the vicinity.

The American Automobile Association more closely resembles the Touring Club of France in its wider scope. With the assistance of the affiliated State organizations it has encouraged legislation beneficial to the motorist, has had great influence in the country-wide movement in favor of good roads and conducts an extensive touring bureau for its members. It has done particularly good work in favoring reciprocity between the States with the result that at present a single license will carry a car anywhere from coast to coast.

(*Concluded on page 59*)

An old posting house at Montreuil-sur-Mer. "The picturesque inns of Normandy are either closed or conducted by old women and old men"

DETROIT SPRINGS

Look for the Lubricating Cups

Roll of Honor

The Names shown below represent some of the users of Detroit Springs

PLEASURE CARS

Cole	Lyons-Knight
Dodge Bros.	Marmon
Hupmobile	National
Kissel Kar	Oakland
Detroit Electric	
Pathfinder	

TRUCKS

Denby	Republic
Federal	Signal
G. M. C.	Standard
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You Ride On the Springs

ALL your weight is on the springs of your car —all the jars and vibration of the wheels come on the springs. Your car safety and your personal safety and comfort depend on the springs.

Remember this in selecting your car.

Detroit Springs are designed for each individual model of car upon which they are to be used. Their steel composition, heat treatment, size, thickness and number of leaves are determined by exhaustive experiments.

Detroit Springs Are Guaranteed for Two Years

This is the only spring guaranteed for such a period against "settling" or breakage. This guarantee alone shows the care used in analyzing the steel, in the heat treatments and the workmanship.

Automatic lubricating cups prevent squeaking and insure smooth, even action.

Extra strength in the center of the spring is secured through a nibbing device which does away with the center bolt.

Look for Detroit Springs, as one of the *big points* in deciding on your next car.

Write for free book, "From the Ore to the Motor Car." It tells all about the accuracy and skill required in the making of springs.

RESILIENT Detroit Springs SILENT TRADE MARK SELF-LUBRICATING

Detroit Steel Products Co.

2210 East Grand Boulevard Detroit, Michigan

FRENCH SURGICAL AUTOMOBILES

BY GELETT BURGESS

"CIVILIZED Warfare" seems to combine two contradictory terms; but it is a fact that the wholesale putting of men out of action is not altogether inconsistent with a certain degree of humanity. For, so far as civilized nations at least are concerned, the object of the latest improved quick-firing guns is not so much the killing of soldiers as "stopping" them—disabling them—that is, sufficiently to destroy their effectiveness as combatants without unnecessary destruction of life.

To this end a special clause in the agreement signed at the Convention of the Hague forbade the use in war of all balls covered with slit or otherwise pierced envelopes—the so-called "dumdum" bullets which, entering a body, mushroom out into forms almost impossible to remove from the wound.

The result has been that of the wounds received by soldiers in the present European war only about 8 per cent have been fatal. This low percentage of mortality has been attained, however, only by great improvements in the ambulance work of the armies in action.

The two opposing forces have, therefore, been developed almost simultaneously—the artillery which has attained almost perfection in the 75-centimeter light field gun employed by the French army, and the automobile ambulance now in use at the front. General Percin, Inspector of Artillery, has himself said, in an article published in "La Science de la Vie," that "we may rely, for our eventual success in the present war, on our progress in hygiene and surgery and the art of taking advantage of shelter from gunfire, rather than upon improvement in the science of ballistics."

For the saving of life on the battle field, to assist the surgical corps that has usually in previous wars worked at a terrible disadvantage, two things are necessary. First, there must be a quick delivery of the wounded; and, second, the medical staff must have at their disposal, and in a portable form, all the appliances known to modern science. For many wounds, such as a penetration of the abdominal cavity, delay is fatal, as intestinal infection is almost certain to occur.

Not only does every hour of delay lessen the chances of success in many operations, but also moving the patient is dangerous. It has become a necessity that army surgeons, therefore, shall have effective temporary stations equipped with all necessary apparatus as near the firing line as is possible.

Surgery on Wheels

IT IS in this direction that military surgery has advanced during the present war, and it has been brought to its highest efficiency in the surgical automobile manufactured by Boulant for the French army.

These cars make it possible to operate while the battle is in progress, not with the atrocious slaughterhouse methods and technique that have made previous wars infamous, but under conditions as advantageous as in the best hospitals, within a mile of the places where the wounded have fallen.

For the transportation of the wounded a special automobile ambulance is used, a simple but ingenious adaptation of any serviceable motor car or delivery van. To understand its operation, however, a description of the method of collecting the wounded during the action should be given, showing how the ambulance forces are disposed.

The Way the Wonder Car Is Used

IN THE first line, almost immediately behind the fighting troops, are the litter bearers, whose duty it is to pick up and carry back all the wounded who are not able to walk alone to the second line. Here the auto ambulances are loaded with stretchers and carry their load back to the third line. There the surgical cars are in waiting with their corps of surgeons, ready to operate upon those soldiers who are most grievously wounded, and who cannot endure further transportation before receiving treatment. This car is, in point of fact, a perfectly working and swiftly moving hospital, much resembling, and very little larger than, a city autobus.

These Boulant cars are mounted upon an automobile chassis equipped with a motor of 35 to 45 horsepower, and capable of traveling 40 miles an hour. They use an engine of four cylinders (cast separately), with 125 millimeters bore and 140 millimeters stroke, and capable of using for fuel either gasoline, benzine, or alcohol.

The body is especially designed to accommodate the many different appliances contained in the car and operating room.

Each of these automobiles is a complete and independent surgical unit, consisting of (1) a comfortable and rigorously aseptic operating room; (2) an adequate collection of surgical instruments, including apparatus actuated by electric motor; (3) sterilizers for water, instruments and dressings; (4) air sterilizers producing ozone, and wall sterilizers using a pulverization method; (5) electric lighting and heating; and (6) radiograph apparatus.

The car is composed of three parts. The entrance is in the rear, through a folding door, giving access to a cabin which serves as a vestibule or dressing room. Here is found everything necessary in preparing for an operation.

At the right hand on entering are two wardrobes or closets, one for the ordinary clothes and the other for the blouses, aprons, caps, etc., of the surgeons. Above are two cupboards for linen. Under the floors, which are covered with "brush" carpet, are the compartments for soiled linen. On the left hand is found a filter whose tank contains 350 pints of water, and a washstand. This vestibule contains all the requirements for a complete change of costume before commencing an operation.

The operating room occupies the middle portion of the car. It has a length of 3.20 meters, and is 2.20 meters in width—quite large enough to leave plenty of space about the operating table. The lighting of the place is assured by windows in the ceiling, and at night by electric lamps. The room is constructed strictly in accordance with the most rigorous demands of modern hygiene, and can easily be kept perfectly aseptic. The walls are of lacquered wood, without open joints and with round corners, while the floor of porphyrolite adds to its cleanliness.

In a metal box are arranged all the instruments in sets, those for each operation—amputation, laparotomy, etc.—being kept separate.

The cases, in spite of their small size, are arranged compactly with a view to the greatest possible convenience. They can be sterilized by means of the autoclave even while the car is traveling. Among the instruments in the equipment of the Boulant car there may be especially mentioned the electric trepan and the saw of Dr. Martel.

The principal feature of the room, the operating table, has been especially devised and manufactured for this car. Made entirely of metal, with the exception of the top, it can be bent to any required position, including that of Trendelenburg. From underneath a Röntgen lamp can be applied in order to examine the wound by means of X-rays while the patient is still on the table, and even without darkening the room, thus greatly facilitating the operation and giving the most serious cases the maximum chance for success.

Under such conditions, the room being well sterilized by the same instrument which produces the Röntgen rays, the surgeon is not only able to see the condition of the body, but even to draw the complete outline of the organs, a process that has not hitherto been possible.

All the instruments required for radiography are stored together in a special glass case on the right-hand side of the operating room.

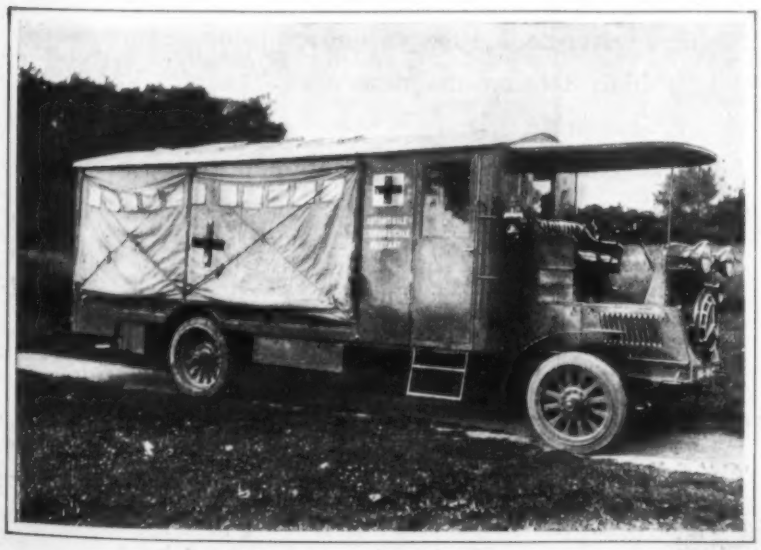
For the purpose of sterilizing the apartment with ozone, two conducting wires may be attached to the apparatus used for the radiography, a spool giving a spark of 30 centimeters. The production of ozone is then considerable, and therefore the sterilization in the small space is more perfect than even in the most modern hospital.

This principal room contains also a washstand for the surgeons. The bowl has two faucets, one giving water sterilized by ultra-violet rays, the other providing water, both hot and cold, sterilized by the autoclave, situated in the front compartment of the car.

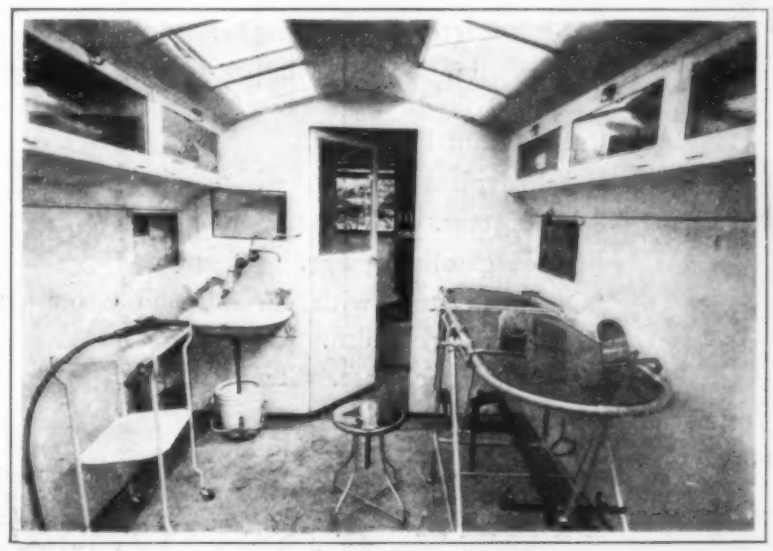
Other Appliances, Too

ON THE left-hand side of the operating room is a cupboard, one part of which may be arranged to form a table and another part a seat. This cupboard contains an electric motor for the surgical instruments and a pump for supplying the reservoirs of the car with water. This pump can be attached to any source of water supply by means of a flexible, removable pipe, and filters at the same time. The reservoirs hold about 350 pints.

In the forward compartment is placed the apparatus for sterilizing water by means of ultra-violet rays,



Mercy on Four Wheels



Inside a French Surgical Car

"It has become a necessity that army surgeons shall have effective temporary stations as near the firing line as is possible. The surgical automobile manufactured by Boulant for the French army makes it possible to operate while the battle is in progress, not with the slaugnter-house technique that has made previous wars infamous, but under conditions as good as in the best hospitals"

. . . Jan. 9

METZ "25"

The Quality Car

TOURING MODEL

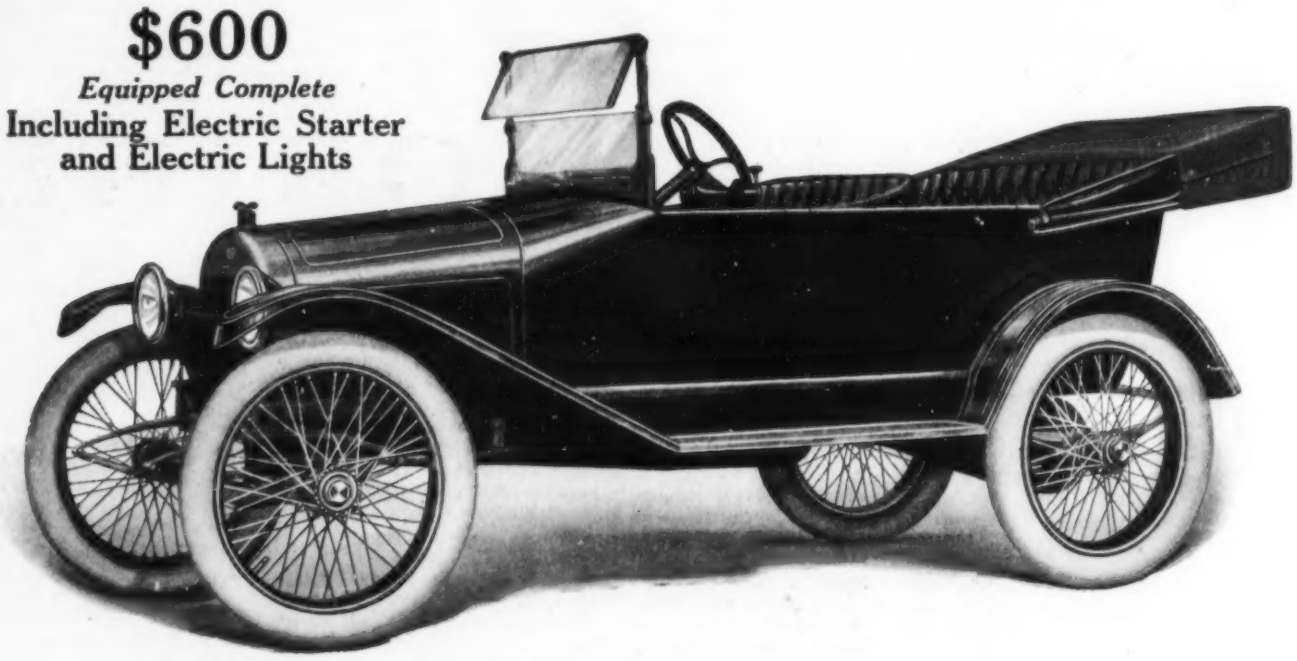
Here is the crowning product of the Metz factories and Metz enterprise—the Metz Touring Model. Luxuriously finished, graceful in design, completely equipped, including Gray & Davis electric starter and electric lights,—*for Six Hundred Dollars!*

The Metz Touring Car marks a new stage in the progress of the automobile industry. It eliminates extravagance, it insures lasting and complete satisfaction. The superior quality of METZ cars is a matter of official record—they have demonstrated this conclusively, in open competition with cars of all makes and prices. You take no chances when you buy a METZ. Read carefully the specifications below, then answer the question—"*Why pay more?*"

$600

Equipped Complete

Including Electric Starter and Electric Lights



Special Features

Equipped with Gray & Davis separate unit electric starter and lighting system.

Electric lights, search lights having large and small bulbs combined.

Pure stream line body.

Polished plate glass rain-vision wind shield.

Speedometer.

Built-in gasoline gauge.

"One man" top, with curtains and cover slip.

A. W. T. signal horn.

105-inch wheel base. Standard tread.

32-inch wire wheels.

32 x 3½-inch Goodrich clincher tires.

25 h. p. water-cooled four cylinder motor.

Bosch high tension magneto.

A. W. T. carburetor.

Seats luxuriously upholstered, with deep cushions.

Full elliptic springs all around.

Shock absorbers.

Left-hand drive, center control.

Fibre grip, gearless transmission—eliminating all gear and clutch trouble.

Tire outfit, jack, tools complete.

Write for new catalog "C," fully illustratea

METZ COMPANY, WALTHAM, MASS.

which it can accomplish at the rate of about 1,000 pints per hour.

It is not necessary to give a description of the method in this account, as it follows the system adopted and practiced by the French Society for the Application of Ultra-violet Rays. It need be mentioned only that this method achieves a perfect sterilization without in any way altering the water.

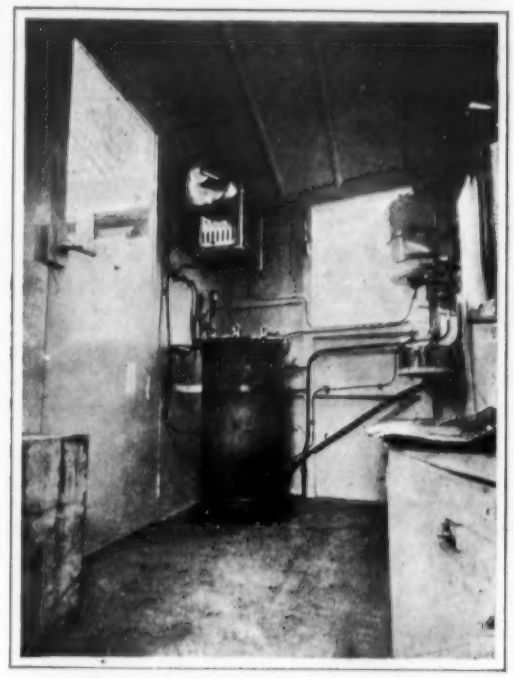
The importance of this water sterilizer, besides its use in providing the reservoirs for the operating room, can be appreciated when it is explained that it enables the surgical corps to provide drinking water to an army in large quantities, even when the sources of supply are thoroughly contaminated. It can within twenty-four hours go to ten different villages, or other sources of supply, and deliver to the troops near the firing line at least 17,500 pints of pure water. The tank alone, situated in the rear of the car, holds some 350 pints, and is easily accessible from outside the car.

Why French Mortality Is Low

BESIDES this water sterilizer, the forward compartment (which has a door leading into the operating room, and a lateral exit as well) holds an apparatus for the sterilizing of surgical instruments, bandages, etc., by means of steam. This autoclave is heated by alcohol. The water, when heated to 130 degrees centigrade, is driven back by steam pressure into the cylindical tank above.

The compartment is roomy enough for a mechanician and several men to ride in, and under it are situated two dynamos, one for the lighting and heating of the car, the other providing power for the electric motor in the operating room. The operation of these dynamos requires, when the car is stopped, but a low speed of the gasoline motor. The lighting efficiency is about 300 candlepower, supplied from storage batteries filled by the dynamos. The lamps will burn for a whole night without requiring a recharge.

The car, when in operation in the field, tents in an extra space on each side, the canvas and iron supports being folded and carried on hooks and fastenings outside the carriage. This area, of about 28 square yards in extent, is used for the reception of the wounded men. By day it is lighted through celluloid windows, and at night by the windows of the operating room. The tent can be folded up in five minutes. The compactness, efficiency, and mobility of this car has already in the present war accounted, in a large measure, for the surprisingly small number of deaths,



The surgical automobile is in some ways "more perfect than the most modern hospital"— as in complete sterilization by means of the Röntgen rays

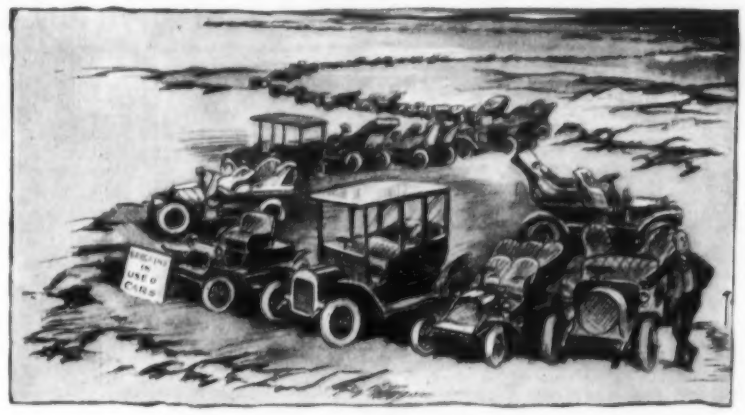
as compared to casualties, in the French army. It is intended, of course, for use in the more severe cases, where delay of transportation would probably prove fatal. But it has been shown that nearly 70 per cent of the wounds received in the war are not serious enough to prevent the soldier from making the journey to the nearest hospital, and thus clear the zone of military operations of the disabled. A man with a gunshot in the leg or arm, for instance, needs only a first precautionary dressing before his trip to the hospital. If he is not able to do this himself, he is treated in the ambulance. But there are many minor cases in which the bandaging done by the patient himself, or by a comrade, immediately after the wound is received, has been found sufficient to protect him for several days, until he has received proper medical or surgical attendance.

For this purpose every French soldier is provided with an individual packet to be carried in the inside pocket of his overcoat. This packet, hermetically sealed, contains sterilized gauze and absorbent cotton and a roll of bandage, enough for two ordinary dressings. The wounded man is instructed to make immediately for the nearest shelter, and there, alone if possible, or with the help of a comrade, to apply first the gauze, then the cotton, and place the bandage over all. He is expressly warned not to wash the wound even if he finds water apparently pure, and to endeavor to avoid any other means of infection which may cause suppuration or fever.

Back to the Front!

THE excellence of both the material and the instructions has been proved in many cases. It has not been unusual to find soldiers, eight days after a wound was received and bandaged on the firing line, with neither excessive pain nor temperature—in so good a condition, in fact, that the original dressing was not removed in the ambulance, nor even in the hospital ward. Many such have recovered perfectly, the wound healing. In similar cases, as well as those more serious, the main thing necessary for speedy convalescence is rest and food. Once they are in the train for removal to the hospital, they are allowed to sleep as long as they will, in the hopes that, upon arrival, they may be at least strong enough to endure the often too cordial demonstrations of sympathy that are awaiting them at the station. After only a few days in the hospital many of them are well enough to go back to the front—and that is all the ordinary French soldier seems to want.

OLD CARS FOR NEW



BY DANA GATLIN

ILLUSTRATED BY T. S. TOWSEY

THE year 1897 was the first year in which automobiles were marketed in the United States. Since then nearly 2,000,000 cars have been built and sold here. During the past decade 600 large automobile manufactories have sprung into existence in this country, each launching from 1,000 to 50,000 new cars a year, not counting the Ford, which last year produced over 200,000 cars—several times as many cars as all the rest.

In the first six months of 1914 the number of cars registered totaled more than 1,500,000—enough, say, to supply one car to each three soldiers engaged on the western front of the great war.

But what becomes of them all? Where have all the old automobiles gone? How long did they retain their first desirability? How did they change fortunes and how often? Who took them in charge, and how, and when, and where, and why? For this problem of disposing of second-hand automobiles—"used cars" the dealers like to call them—has developed a business of a magnitude exceeded only by the manufacture and selling of new cars.

There are, broadly speaking, five distinct methods of dealing with the second-hand situation. Regular second-hand dealers maintain exchanges for used cars. They buy cars and sell them "as is," meaning "unguaranteed." The big Eastern concerns, besides reselling in the local market, furnish large supplies for export.

Many manufacturers have instituted "exchange departments," where the old cars, of all makes, which have been "traded in" by purchasers of new cars, are "rebuilt" and sold with a guarantee. These salesrooms are operated under a different name by some companies.

Other manufacturers maintain "service departments," giving especial care to the upkeep of their patrons' cars with the idea of encouraging customers to run their cars as long as they are in good condition instead of arbitrarily changing every year or two.

Some of the manufacturers of expensive high-grade cars refuse absolutely to touch a "trade" proposition. They are willing to receive a customer's old car and try to sell it for as much as it will bring; but this is a transaction entirely apart from the sale of their new car. Each sale must stand on its own bottom.

Finally, there are the "gyps," weird successors to the old-time horse traders who, with no offices save in their hats, but with a wad of money always in hand, wander about the automobile districts of cities. They buy and sell old cars in haphazard fashion, and thrive surprisingly—some of them—on their "specs."

The "exchange departments" conducted by the manufacturers take a used car which has been "traded in" and put it into such order as to justify a sale under a guarantee. This brings it under the classification of "rebuilt cars." In these departments, also, used chassis are rebuilt into light trucks, taxicabs, delivery wagons, etc.

I talked to the manager of an exchange department operated by the manufacturer of an expensive car. The salesroom was as large and well equipped as those displaying new cars. The manager conducted his business in a big, systematic, organized manner.

As we were talking I heard a woman saying: "Well—if that's the best you can do. For I simply *must* have that car."

The manager showed me the car that the woman "simply *must* have." It was a beautiful thing. The limousine body was painted a dark, particularly soft, and neutral gray. With this the violet and mauve of the tapestry upholstering and the violet silk curtains harmonized delightfully. A push-button device would lower the windows to any fraction of an inch. There were other push buttons to switch on the lights—soft lights, bright lights, lights on this side or that or overhead. A telephone connected with the chauffeur. It was the last word in automobile beauty, comfort, and style.

"What lovely decorations!" I said.

"One of the leading decorators of New York did it," explained the manager.

"No wonder the woman wants it," I commented.

"She's sacrificing over $2,000 to get it," he said. "And her old car is just as good, excepting that it hasn't the latest refinements nor the 'style.'"

"What's she doing it for?" I asked.

He shrugged his shoulders.

"What is the average rate of depreciation in the value of cars?" I asked.

"About 50 per cent the first year—it goes down half with the first 500 miles, you might say; 15 per cent more the second year; 10 per cent more the third year. After the fourth or fifth year the valuation remains fairly stationary."

"Then it's a better business proposition to hold a car at least five years," I said.

"Well, if you buy our new $5,000 car, you can get only $2,500 for it at the end of the first year. It may bring $1,500 after five years if it's in good condition."

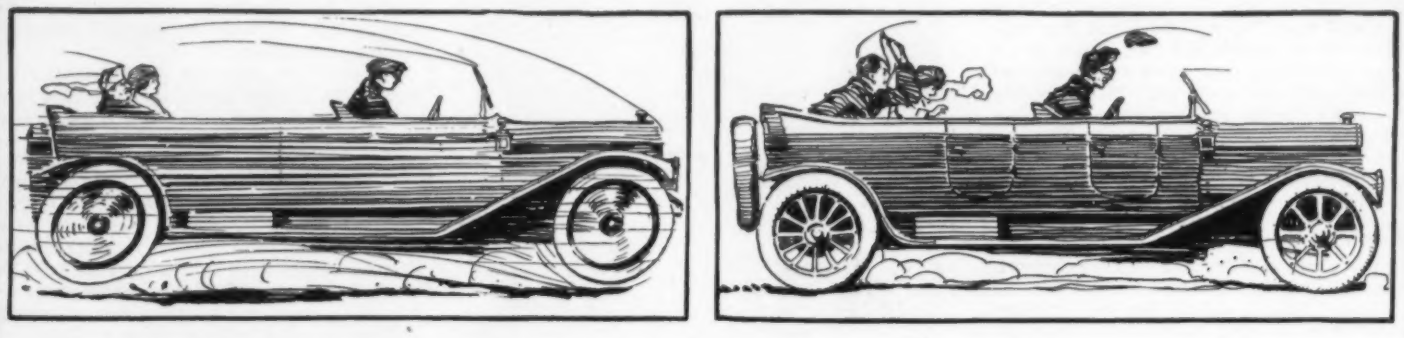
"Why does the rate of depreciation make that first big drop?"

He shrugged his shoulders again.

"Why? You heard that woman over there. She 'simply *must*' have the new car. It isn't that her old car doesn't do its work well, but that she's made up her mind to have the new one, taking whatever she can get for the other."

Then I realized that the thing is nothing but a question of "style." It is the loss of "style" which causes the depreciation. With automobiles it is the same as with shoes. A pair of shoes in their first blush, pretty and spick and span, are at their best in appearance, even though they are not quite "broken in"; the second year they may be just as serviceable and more comfortable than at first, but they have lost their first freshness. So with an automobile. A good car does not reach its best, mechanically, until its second year, after it has traveled several thousand miles. But, like the pair of shoes, it has lost its absolutely fresh beauty, even though it still may be very good-looking. At the end of a few years more it is like the pair of shoes, now patched and half soled. These may be good for getting over the ground, but now they are solely utilitarian.

And the Very Next Minute—? ? ? ? ?



A 40 H.P. Engine *versus* What (?) H.P. Brakes?

You *know* your car's *engine* power. But *what* do you know about its *braking* power? Can you swear that your brakes won't fail you in a pinch?

Probably you don't know just how your brakes are lined. Too few drivers do. But for Safety's Sake mark this: if the brake lining on your car gives you less than 100% gripping power, *you flirt with disaster every day you drive.*

Thermoid HYDRAULIC COMPRESSED Brake Lining - 100%

Many automobile owners do not even know that brakes are *lined.* Of those who do, few could tell you what with.

You—and thousands of others—investigate engine power carefully. Axles; tires; extras; lighting and starting systems; all are studied.

Every necessity and convenience for putting and keeping the car in *motion* endure your mental acid-test.

Yet most men—perhaps YOU—neglect that all-important factor, brake lining, on which *brake reliability* depends.

Of course it's annoying when your car won't start. But—it is dangerous when it won't *stop!*

* * * * * *

Leading automobile manufacturers protect you to their best ability by equipping with good brake lining. (Thermoid is used on more high-grade cars than all other linings combined.)

But the best brake lining will wear away in time. *Less* than the best loses its friction power long before it is all gone.

You must protect yourself.

When you buy a car, insist that it be Thermoid-equipped. If you have driven your car a time, have the brake lining tested. When it comes to re-lining, demand Thermoid. In that way you can be sure.

* * * * * *

Brake lining, to be 100%, must be brake lining all through. Not merely on the outside. You trust it with your life. Hence, it must be trustworthy to the last.

Thermoid retains its 100% gripping power even until worn *paper-thin.* Hydraulic compression makes it one solid, single substance of uniform density clear through—instead of being loose and stringy (and friction-shy) on the inside, as is ordinary woven brake lining. Cut a piece of each open. You will *see* the difference.

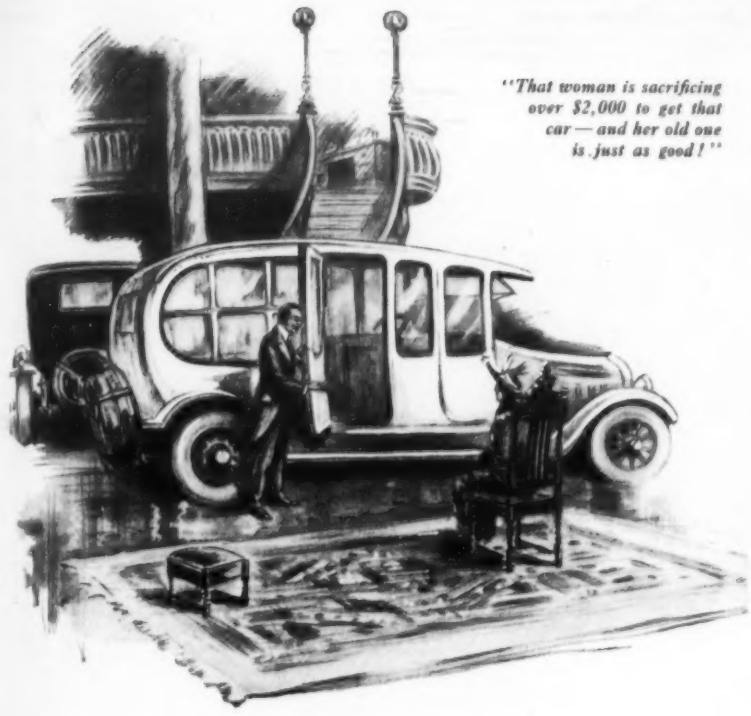
Thermoid cannot be burned out nor destroyed by any heat generated in service. It cannot be affected by oil, water, gasoline, dirt. Its wearing-life is greater. It contains 50% *more* in actual material.

No man knows how many accidents Thermoid might have prevented. We can only urge *you* to guard YOUR safety with Thermoid.

When You Must Stop Your Car, Trust Thermoid.

Thermoid Rubber Company, Trenton, N. J.

Our Guarantee: Thermoid will make good—or we will



"That woman is sacrificing over $2,000 to get that car—and her old one is just as good!"

I asked the exchange manager another question:

"Who wants to buy old cars?"

"The people who buy from us," he answered, "are those of keen business judgment, but without an exaggerated sensitiveness as to the latest kinks of 'style.' They reckon the merits of substantiality, comfort, and solid dignity, and they recognize real values. You'd be surprised to know some of the people who hunt for this kind of values in cars. One millionaire here in New York has never owned a new car. But his cars stand up well, appear creditable, give the best of service—and cost him half.

"Our customers all know that what they get from us is absolutely what it's represented to be. Of course this condition of confidence can't hold with the second-hand dealer who buys and sells 'as is' without any kind of guarantee. People are learning. Five years ago the second-hand dealers had a monopoly of this business. I know of one big second-hand company which, during a certain month in 1912, sold $109,000 worth of used cars. During the same month, 1913, it sold $78,000; during the same month, 1914, $44,000 worth."

Later I talked to a New York second-hand dealer. He conducts an enormous business, buying used cars of all makes, grades, and styles—reselling "as is."

"How can a man buying from you tell what he's getting?" I asked.

"I won't buy cars that aren't in at least fair condition," he informed me. "It doesn't pay. The buying public is becoming familiar with the mechanical condition of cars. Before setting out to purchase, they read up. Or they secure the services of a reliable mechanic. Reputable second-hand concerns have to keep salable cars, so we've stopped buying poor ones. At our low schedule of prices, we can't afford to rebuild. It costs from $200 to $400 to thoroughly overhaul an old car. Take a medium-priced car—say, one worth $1,500 two or three years ago. It can't bring much over $600 even if guaranteed—that is, with $200 worth of overhauling on it. We can't afford to do that."

"But how can the manufacturers afford to do it?" I asked.

Auto-Bulls and Auto-Bears

"THEY can catch up the loss on the new car they've given in exchange. They curtail some of the little services which they usually give gratuitously to a new car after it's been sold. Or they charge for these and charge high. Generally speaking, though, the manufacturer tries to sell the used car for all or more than he allowed on it.

"In other words," I said, "the manufacturer who has an exchange department is a bull in the second-hand market, while the second-hand dealer is a bear."

"You might put it that way," he agreed. "However it is the second-hand dealers who establish the prices on used cars. Also, we handle manufacturers' oversupplies. We can buy 'unused' cars cheap and advertise them in a way which the manufacturers, centering on their latest models, cannot. And we make money." I mentioned this last statement to the head of another "exchange department."

"Yes," he admitted, "the reputable dealers work with us. They can market our oversupplies at their cut prices, but they mustn't quote the dates, if too recent, lest they injure our regular sales. But they get pretty good prices anyway. When a second-hand dealer advertises 'unused cars' of a standard make at a ridiculously low figure, you'd better watch out."

Certain manufacturers, who refuse to endure the annoyance attendant upon "trading in," maintain no exchange departments. They take no old car in exchange and grant no allowance, regardless of whether or not the old car is sold and for what amount—the sale of the new car must stand on its own bottom. They try to persuade the customer to hold his old car as long as it is in good condition. Some of them maintain "service departments." Here, for a small sum, the cars are regularly inspected.

The head of one of these "service departments" explained to me the merits of the system.

"An owner gets a lot more enjoyment out of his car if it's kept in top-notch condition," he said. "Good cars are constantly being ruined by ignorant or negligent chauffeurs. The average chauffeur is not a first-rate mechanic. If let alone, he can materially injure a car without the owner's knowledge. The danger is greater if the owner—as a great many of them do—employs a string of chauffeurs in succession. This ignorant tinkering's what speeds the ruin of a car's mechanism—the tinkering of a dozen pairs of hands. Now we, by our system—inspecting, instructing the chauffeur, and reporting to the owner—find that the same disorder seldom has to be reported more than twice, and that after a few inspections the car is being kept in practically perfect running order."

I asked him how long an average car, with reasonable care, should stay in first-class condition—so that, from a service standpoint, it really was worth more than it would bring in the second-hand market.

He hesitated.

"It's hard to estimate that," he answered, "because so much depends on individual treatment. Generally speaking, a good car, treated right, ought to be entirely satisfactory for four or five years. A high-grade car should last fifteen or twenty years. But its commercial valuation is another story.

"You know," he went on, "that a car of expensive make goes down $1,000 with the first 500 miles it runs, yet every mechanic knows that a heavy, expensively built car requires to run at least 5,000 miles in order to get its gear tuned up. The man with a keen sense of values knows just when to dispose of his high-grade car. He knows that after it has been run for ten or twelve years, its value in the second-hand market would be only a few hundred dollars; and also that he would have to spend for overhauling, every year or two, an amount equal to the total value of the car."

The "gyp" contributes to the automobile-exchange business the most unreliable, haphazard, and picturesque methods. The derivation of his soubriquet probably traces from the word "gypsy," in the sense of homeless. He loiters with a roll of bills in his pocket around the streets most promising for his purpose, cocking a speculative eye at every car standing by the curb, till he noses out a bargain. Then: "How much do you want for that car?"

If his overtures are favorably received, he begins to dicker. He talks in a cheap jargon: "Take two-and-a-quarter?"—"No!"—"Two-fifty?"—"Well, I'll give two-and-three-quarters, then." Which means that his final offer was $275. Like the horse trader, too, the "gyp" considers points of appearance almost exclusively. He seldom rides in a car to test it out. It may be a stolen car for all he cares.

His next step is to unload his purchase as quickly as possible. He will often sell at a very small profit—$25, $15, $10, even $5. Or he may resell the car to a second-hand dealer for the identical amount he paid for it, first removing a $35 horn, a lamp, or some other accessory, which he sells extra. That this uncertain, diluted kind of business can be done in quantity sufficient to pay is attested by the fact that a partnership of "gyps," working without an office or a car in stock, did a $25,000 business last year. They kept office hours on the street and did business where they found it. They asked no questions. Their motto was: *"Quick and cheap."*

If a stolen car is caught in the possession of a "gyp," it is, of course, confiscated. In New York and other large cities a special force of detectives is apportioned to the tracing and recovering of stolen cars. Recently a friend of mine, whose car had been stolen, was out with two of these specialized policemen when he noticed one of them suddenly focus his eyes.

"See the guerillas with the caddie over there!" he said to his confrère.

This, translated, meant that the occupants of a Cadillac which was drawn up at the opposite curb, were suspicious looking. The sleuths jumped out of their car, ran over, and began to investigate certain points. True enough, it proved to be the stolen car.

Some of the more dignified "gyps" maintain desk room at certain addresses, but a much larger number have a regular "hanging out" place in some building whose address they appropriate as their own, paying the elevator man $1 or so a week to inform inquiring customers of their whereabouts.

The Ravening "Gyp"

HAVING picked up a car in his characteristic manner, he may save himself the cost of storage by turning it over into a dealer's keeping, with an agreement regarding a percentage from the sale. The sale he attends to himself, luring customers by means of rosy advertisements, in which "gentleman going to Europe" or "gentleman having met with financial reverses" is represented as being "obliged to part with his absolutely first-class car." All the dealer has to do is to pocket his fraction of the profit.

Or the "gyp" may work in this way: He says to a dealer: "I think I can sell such-and-such a car for you. How much do I get?" The dealer names a small sum—$25, say. "All right," agrees the "gyp." Whereupon, he goes out and advertises the car as his own, brashly receives prospective customers, and displays "his" car and "his" establishment. If he is unable to push through this deal, he may lead the way to "my place" up in the next block, where of course, he has other prearrangements pending.

He never issues a receipt. He has no trade name.

"How they get away with it, I don't know," one second-hand dealer said to me. "It's risky enough, goodness knows, buying a second-hand car when you go to a reputable place and they try it out for you. But I've known of a customer's getting next to a gyp's shaky foundations, and even then letting the gyp put it over. The gyp explained how he could give closer prices than the regular dealers, because he had no high rents, help hire, and other expenses; because he dealt only in a few cars, and so could select the best bargains, etc., etc. His logic was rotten, but it won out. And all the time it was a dealer's car, which could have been had $25 cheaper by buying direct."

"Who accidentally ran across his first car this summer in Maine—"

So I found out why there is no stability of figures in the second-hand motor world. There can be no absolutely standardized rate of depreciation where there are such different conceptions of the way to do business of exchange and of values.

I know of a New York millionaire—and he is not a millionaire—who contends seriously that to buy a new car each year is not extravagant. In twelve years he has bought twelve new cars, each valued at from $5,000 to $7,500. He says he saves money by selling a car when it is a year old. He reckons his annual savings in this way: Winter storage, $100; overhauling (new cushions, accessories, etc.), $400; repainting $150. The maximum sacrifice the manufacturer imposes upon him at each exchange is $1,000. As the man is exceptionally fastidious about points of "style," he reckons his loss *nil*.

Every big American city has its quota of people who are, as the phrase goes, living ahead of themselves. Yet these people do not deem themselves unduly ex-

The Results of Experience

Westinghouse Electric Systems—Starting, Lighting and Ignition

NOT always does a motorist, unless he has had experience in such matters, give much thought to the electrical equipment of his car.

The experienced motorist though, knows that every detail of his starting, lighting and ignition system deserves the same investigation and thought that the details of the rest of his car require. The motorist depends on his electric equipment for his fullest satisfaction in motoring. Even the automobile manufacturers admit that it has taken them three seasons to learn the difference between the electric systems that look well on paper and those that wear well on the road.

This season the motorist who knows what sort of service to expect from high grade starting, lighting and ignition apparatus, and also the manufacturer who has run the gamut of experience and "experiences" with ordinary systems, will study the Westinghouse-Systems—Starting, Lighting and Ignition—with interest and will note particularly their simplicity, their workmanlike construction and their record of operation.

Westinghouse Generators for lighting and ignition, or for lighting only, give as near 100% efficiency as a machine of this size can give—entirely enclosed and with a special treatment of the windings that prevents damage from heat, water, oil or gasoline—no friction clutches to wear away and lose power—high grade ball bearings—self regulating—compact and light—substantial throughout—good for ten years' satisfactory work without repairs.

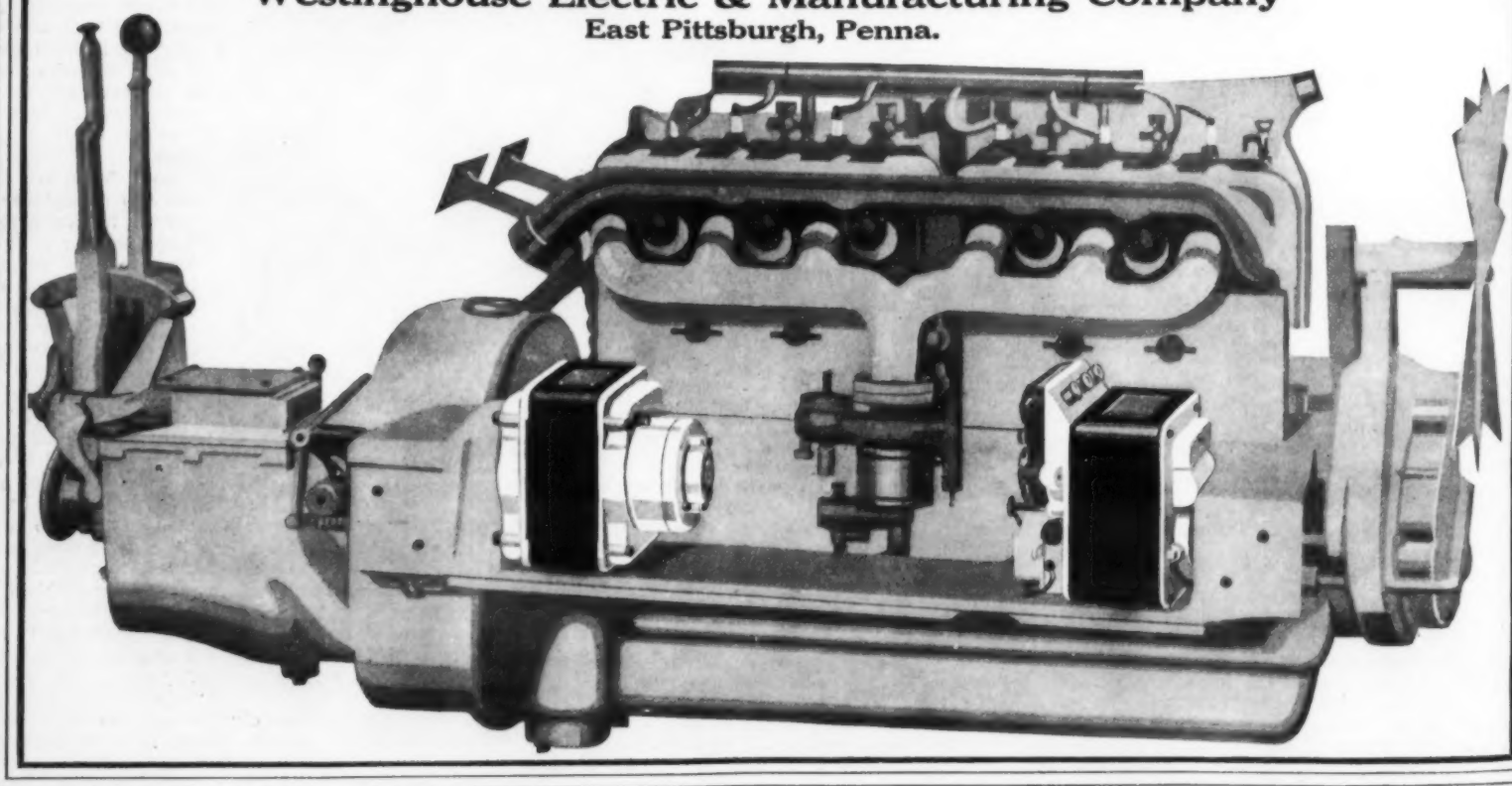
Westinghouse Ignition combines the best that years of experience have made possible—a hot positive spark that gets the full power back of every piston stroke—always dependable regardless of adverse weather and temperature conditions—the fattest spark with the least consumption of energy.

The *Westinghouse Starting Motor* does its strenuous work with a minimum drain on the battery so that batteries last longer—will start the engine when cold and stiff and against back fire—windings proof against damage from heat, oil or water—ruggedly built—powerful far in excess of its size—will outlast the life of the car.

Logically this is a Westinghouse season. The motoring world is now seeing the necessity for standards—standards as high as Westinghouse Electric set for itself when it first entered the field of starting, lighting and ignition for automobiles.

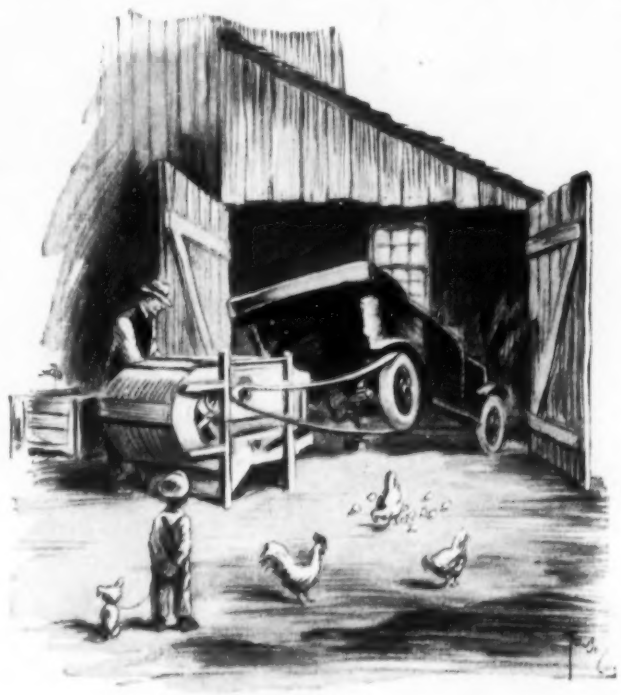
The Westinghouse systems are sold only to manufacturers. But in the final analysis, the refinements of the better cars are suggested by the needs of the experienced motorist; and as he gets to thinking more in detail about what constitutes his car, more and more he demands such standards as those to which Westinghouse Electric builds.

Westinghouse Electric & Manufacturing Company
East Pittsburgh, Penna.



travagant when, possessing no investments and paying rent, they purchase expensive cars. Those ancient jokes about men mortgaging their homes and furniture are far from being founded on fiction.

In New York a particularly gilded variety of "front" is to be observed through the working of certain hacking companies. These companies buy used Packards which set up a good appearance, and dress their chauffeurs in handsome livery. Then they rent a turnout at $400 a month. The patrons of such companies, of course, are people, many of them, who because of their love of show are not contented to buy and run a low-priced car. If they cannot afford to own a costly machine, they wish at least to appear to. It is the women, dealers assert, who are largely responsible for the big business in exchanged cars. They do not consider extravagance in rushing to keep up with any style. A woman refuses to wear her last season's hat, even if it is perfectly good and becoming. She has a weakness for the up to date.



Jacking up a rear wheel the farmer uses his automobile power to do odd bits of work

It must be admitted that this trait is pretty common to the American nature, regardless of sex. There is no country in the world where something that is not like everything else attracts so much attention. Abroad it is different. In Paris there is style, but there need not necessarily be universal uniformity. A young American I know, who lived in the Latin Quarter of Paris, used to dress himself grotesquely merely for amusement. In knickerbockers, bedroom slippers, and different-colored stockings, and accompanied by a friend also strangely costumed, he would wander through the Rue de la Paix and over the Grandes Boulevards. But no one would pay any attention to him. In Europe style can be more or less individualized without comment. Many men, considered very fashionable in London, have their hats made on the same block year after year, and their boots and shoes made on the same last. They find a style that suits them and stick to it. Not so in America. Everybody must hustle to keep up with the very latest.

And it is so with motors. Last year's motor is as noticeably out of date as last year's hat. The automobile manufacturers change styles yearly, to persuade people to buy new cars, just as dressmakers do it to persuade women to buy new clothes.

Between cars and women's clothes, by the way, there is a closer affiliation than many of us realize. The president of a motor car company told me that when the exceedingly long corsets came in vogue for women, the style of limousine seats had to be changed so as to conform comfortably with the lateral lines of the passenger's body. He also told me that the width of women's hat brims affects the width of limousine doors, while the height of crowns affects the height of limousine bodies. So much trouble was given automobile manufacturers by these considerations that they finally delegated one of their number to go to Paris and consult famous milliners with a view to regulating the measurements of hats.

Fads and Fancies

FROM year to year the fashion designers of automobiles have worked as earnestly as have their brother artists in the Rue de la Paix—much in the same manner and with the same purpose. Once the fancy lines of the automobile's body rivaled those of an ornamental circus wagon, as far removed from the simple grace of the 1915 model, with its full stream-line body, as balloon sleeves were removed from those of the present day. Side doors came into style, then fore doors. Bonnets have varied in size and slant. The methods of lighting have changed repeatedly. To-day the electric-lighting system has been so perfected that the driver can switch on lights of varying brilliancy, in various parts of the car, by merely touching buttons within easy reach of his seat.

Many of the "refinements" which are added season after season are extremely practical conveniences. Many of them are mere points of "style."

In New York there is a saying that a man is more sensitive about the appearance of his car than he is about the appearance of his wife. But, as stated before, New York dealers claim that, in the majority of cases, it is a woman who engineers the exchange of a good but out-of-date car. Perhaps she observes that it does not possess certain "refinements" which embellish the cars of her woman friends. Or, when she drives up to certain fashionable restaurants for tea, she observes that the door flunky shades his manner to suit the inferiority of her car.

This human factor often shows itself in an amusing guise. Not long ago a man entered a second-hand place and pointed to a car in the window—a smart-looking, racy, low runabout, painted cream color.

"I'll give you $800 for that car—not a cent more," he announced with determination.

The salesman (he told me the story himself) began indicating the runabout's good points as though it might merit a higher price.

"Not a cent more than $800!" reiterated the customer. "I set its value as soon as I saw it. That's my offer. I'll close up the deal on the spot."

"But, don't you want to go out with a demonstrator?" began the salesman, hesitatingly.

"No need."

"I just mentioned it because it's your privilege to have it."

"No need," repeated the customer. "I know what I want when I see it. I'm not like some folks who have to fuss around for a month and then don't know what they want. It never takes me five minutes to make up my mind."

"Must save you a lot of time," commented the salesman.

"It does," admitted the customer.

So the sale was consummated for $800, and the man took his car away. It was worth at the outside $200. It was painted to look well, but had a no-account engine. When proposing the demonstration—a very honest thing for him to have done, according to the code—the salesman was breathing a fervent prayer that the engine wouldn't stall when turning the first corner. But the man knew what he wanted. He set his own price—and was allowed to set it.

Paint and Profit

FIFTY DOLLARS' worth of painting and varnishing has often sold a car for $200 or $300 more than it otherwise would have brought. Also, many a good car, with its body sloppy and worn-looking, has gone to a judge of good motors for a song. But those things do not happen so much nowadays. The dealers say that people do not buy automobiles on their appearance so much as they did three or four years ago. Buyers from outlying districts, formerly considered the legitimate prey of unscrupulous second-hand dealers, are learning that one can buy a car too cheap—and spend more than its worth in keeping it running.

However, the farmers, small tradesmen, and people of moderate means throughout the country—the people who to-day constitute perhaps the most important market—are often willing to buy an inferior car with which to experiment. When they have learned their lesson from its mechanism they begin figuring on the purchase of another car. This may be either a new one or a used car in good condition.

The Western car owner, after passing from the first tyro stage, often buys a second-hand car, but of good make and in fair condition. In the West, as in the East, the strong competition is between high-grade used cars and new cars of a cheaper grade. The new cars of the most expensive makes do not enter so largely into the game. On the other hand, manufacturers of medium-priced cars reckon to sell the bulk of them throughout the vast stretches of inland country.

It is estimated that, in the Middle West, there are five Fords to one from all the other makes combined. This popularity is due to the fact that the Ford has proved substantial as well as cheap. Westerners are supposed to show themselves unusually canny in buying medium-priced cars which possess the advantages of higher-priced cars. The second-hand industry in the West has now grown to such an extent that most of the large cities have their own exchanges. These often are conducted on more stable principles than are the exchanges of New York.

It is said that Western dealers in new cars generally make more liberal allowances than Eastern dealers for used cars offered in exchange. The competition for trade is extremely keen, and the customer stands a chance of minimizing his sacrifice if he shops around. Facilities for advantageously disposing of used cars are unusually good. In the first place, buyers do not expect so much reduction in a low-priced car as in a high-priced one; and most of the cars are low priced. In Kansas City there is a sort of automobile clearing house.

It is said that any used car will bring 25 per cent more in the South or West than in the East. This statement is attested to by the practice of outlying second-hand dealers who come from various smaller cities to New York twice a year. On these visits some of them buy as many as five or six carloads of used automobiles from the second-hand places or from the exchange departments of the manufacturers. Their patrons are not worrying so much about "style" as about durability. Another market has been opened up for America's used cars in South America and Cuba.

The Auto's Wheel of Life

IT IS difficult to trace automobiles, through their life of exchange, to their final demise. I know a man who accidentally ran across his first car this summer in Maine. It was an original Ford, and was now comfortably settled on a farm. Another man I know has traced his first car through eight ownerships. It is now a hack and meets suburban trains. In the larger towns and in the cities the taxicabs with their uniform bodies try vainly to disguise a similar descent in the social scale.

Some old cars, built by those expensive factories which insure them to "stand up" well, evolve into smart-looking delivery wagons. In New York, along Fifth Avenue and other fashionable streets, may be seen the elaborately painted, well-kept-up delivery autos of a certain fashionable florist. They are Panhards, of the old-time, chain-drive vintage of 1907. Many second-hand companies make a practice of removing the tonneaus from antiquated cars, rebuilding the bodies, and putting them out as light roadsters.

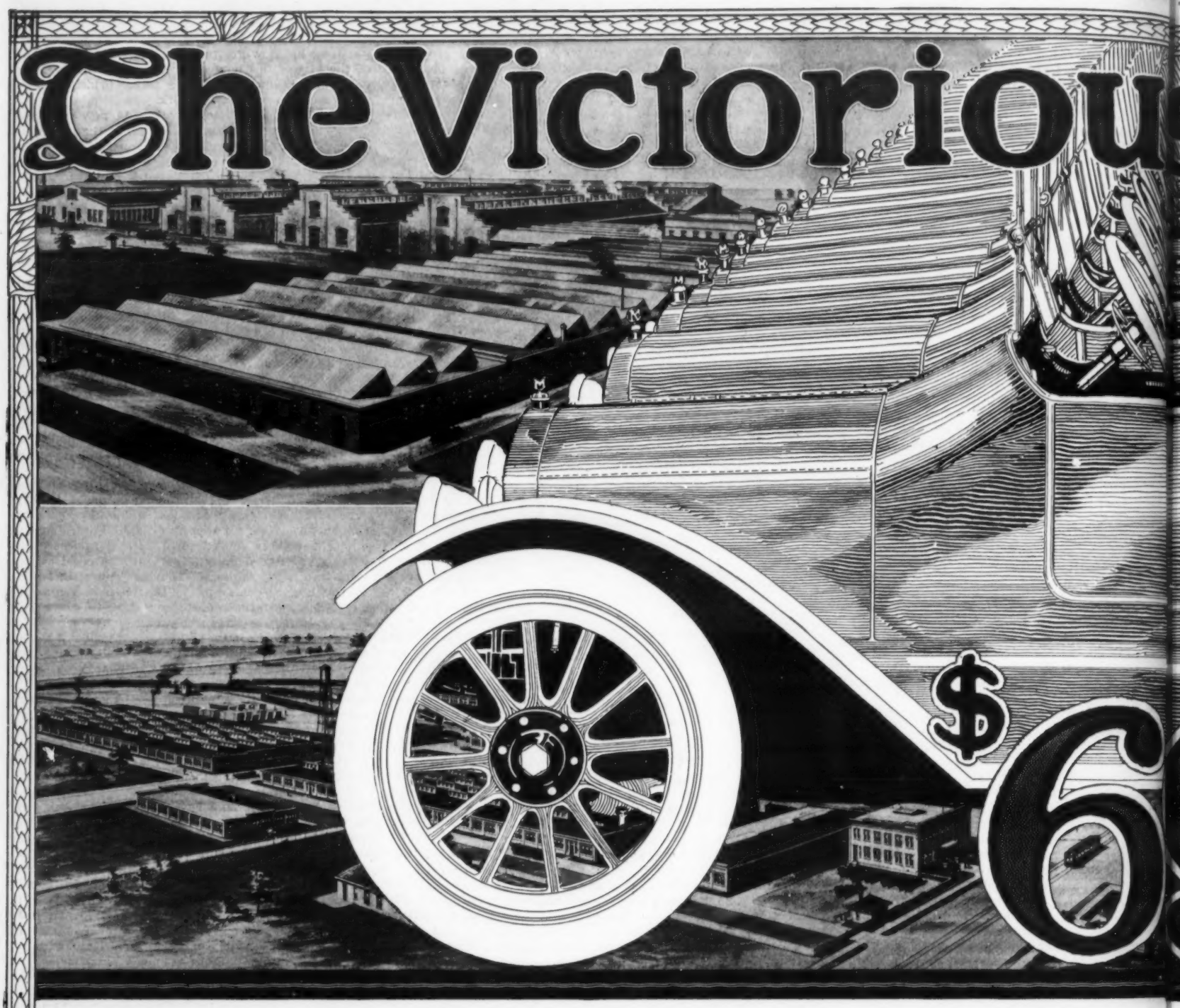
An automobile never knows what it may become or what service it may be brought to perform. Out in Kansas, farmers often use their automobile power to do odd bits of work ordinarily performed by hand or by a stationary engine. Some farmers fasten their automobiles to plows, using them instead of horses; or, jacking up a wheel, they run a belt around it back to a saw or a pump or a churn.

A Western branch office of one well-known automobile company removed the generator from an old couple-gear truck and connected it directly with the motor out of an old automobile. This device now furnishes the electric power to run all the shop machinery and the lights in the building.

I know of one case in which a man bought for $4 a car which had been worth $1,500 in 1907, but which had passed through many hands and was considered junk. He paid $4 for it because it had a good engine. Now the engine is set up, stationary, in a shop where it is doing steady work.

There seems to be no definitive demise to a motor car. Even after it has gone through a dozen lives, after it has descended the social scale till no one remembers its beginnings, after the greater part of it has found a grave on the junk pile, its vital part lives on.

"How much do you want for that car?"



"Batteries" of Maxwell Cars are being

The 1915 Maxwell "Wonder Car" has actu

A New Standard of Power

The 25 h. p. bloc type motor of the "Maxwell" develops more power for the weight of the car than the motor of practically any automobile at any price. The motor is a silent, smooth-running marvel, and makes the "Wonder Car" one of the greatest all-around hill-climbing cars in the world.

A New Standard of Economy

Very light weight, yet powerful, strong chassis, Simms high-tension magneto, the economical Kingston carburetor. Wonderful, modern, thorough cooling and oiling system, giving a wonderfully low cost for gasoline, oil, tires, and repairs. Real economy in a real full 5-passenger car.

A Beautiful Full 5-Passenger Touring Car With Seventeen New Features

(WITH ELECTRIC STARTER $55 EXTRA)

"HOLDS THE ROAD AT FIFTY MILES AN HOUR"

Write for beautiful 1915 Catalogue

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595

ing shipped to Maxwell Dealers every day

s actually set a new standard of automobile value.

A New Standard of Beauty and Easy Riding

Elliptic springs, luxurious upholstery, and correct body design combine to make the "Maxwell" a phenomenally easy riding car.

In appearance the "Maxwell" equals any car. The pure streamline body, crown fenders and close to the ground effect make it a real beauty.

A New Standard of Simplicity of Operation

The operation of the "Maxwell" is extremely simple. Left hand drive, center control, adjustable front seat (movable forward or backward), easiest clutch operation, flexibility of motor, and an unusual degree of "handiness" make the "Maxwell" one of the easiest cars in the world to drive.

Built complete by our four gigantic Maxwell Factories at Detroit, Dayton, and Newcastle.

Every car backed by the great Maxwell Motor Co., Inc. Service Stations in principal Cities.

PRICE IN CANADA $925

MAXWELL MOTOR CO., Inc., Detroit, Michigan

The Quest of the Car

AN AUTO-BUY-O-GRAPHIC BALLAD

By ARTHUR GUITERMAN Decorations by M. L. BLUMENTHAL

"NOW whither and whither, Lord Ronald so gay,
And whither so free and so far?"
"I haste to the Bounds o' the Great White Way
To choose me a Motor Car."

"And what of the Car that ye mean to buy—
Its name and its Pedigree?"
"Oh, ask of the Wind in the sounding Sky,
But ask not that of me!

"For it may be a Leal or a Pupmobile,
A Krag or a Biff-McClung;—
For many, ye ken, are the Motor Men
And marvelous glib of Tongue.

"It may be a Czar or a Kwiggle-Kar,
Or else, for aught I know,
A Reinhardt-Fritz or a Dunderblitz
Or a Clement-Rochefoucauld.

"For vowed am I to a Mission high—
To search from East to West
All Lands that are till I find the Car
Which is approved the Best.

"For I have sworn to my Lady Jane
By her milk-white hand so small
That none will I take for her sweet Sake,
Until I have seen them all!"

Lord Ronald was come to a proud Garage
That stood by a dismal Fen;
And there, by the Sound of their Persiflage,
He knew were the Motor Men.

And one there was with the Eagle Eye,
The Face of the Hatchet True,
The Shell-rimmed Glass and the Bulgar Tie
And the Collar edged with blue.

Oh, Rubies four had the Ring he wore,
His Coat had the Latest Shape;
And his Cheek, shaved clean by a Razor keen,
Was the Cheek of the Brazen Ape.

He haled the Knight by the Fingers wan
To where with Radiance crowned,
A Golden Car was throned upon
A Turning-table round.

Oh, twice he bowed and thrice he bowed
Before that Golden Chaise;
Then full and strong and loud and long
He sang its Hymn of Praise:

"Approach! Approach! redoubted Knight! Approach, oh lucky Neophyte, and view upon this wooden Stage the Wonder of the Horseless Age; the King, the Ace, the Jack and Queen of all that runs by Gasoline; Invention's Incandescent Star, the Unexampled Kwiggle-Kar! The Motor, first: I wish to state the Cylinders (they number eight with Tungsten Valves) are cast en bloc; and steady, steady as a Clock this Shaft of Higginbotham Steel propels the Patent Caisson Wheel which cannot slip in Mud or Mire because it wears the Skidmore Tire. Observe the Sweep from Front to Rear!—the Spiral Bevel Axle Gear, the Floating Axle, Intake Pipe, the Carburetor (Ogham type)! Can Future Ages say too much about our Multimetal Clutch—the Brake that never disappoints, the Banning Universal Joints? Remark our patent 'Sudden Stop'! Oh, see our Spanish Leather Top, the easy-swinging Pinchless Door, the Turkish Rug upon the Floor! The Cushions, neatly tilted there, are stuffed with Hand-picked Monkey Hair. The Roland Horn—the Oval Springs—the Case for Goggles, Gloves and Things—Ignition—Circulation—Splash—Transmission—Spark Plug—Bumper—Dash—Magneto—Radiator—Feed—Control Equipment—Starter—Speed!—"

He gasped and he clutched at the Atmosphere,
He fell to the Parquet Floor.
Lord Ronald bequeathed him a Silent Tear
And went to the Shop Next Door.

"Come hither!" he cried to the Man in Charge,
"O thou of the Stately Mien,
And tell of the Merits both small and large
Possessed of thy Buzz machine!

"For far have I ridden and far must ride
Abroad on my Knightly Quest
To find, of all Cars in the World so wide,
That Car which is proved the Best."

The Motor Man rose from a Mission Bench
That was of the Quartered Oak,
And, beating the Air with a Monkey Wrench,
His rhythmical Piece he spoke:

"They brag—yet do not heed howe'er these others boast of Safety, Smoothness, Speed, or Trips from Coast to Coast. For even if they show a Vase for Silken

Flowers, they have not — well they know! — a WIND SHIELD like to ours! All others in the Field lament: 'Alack, alas! we cannot match this Shield which is not made of Glass'! 'Tis cut of Crystal clear that may not crack or dim; who has it need not fear, for naught can injure him. Behold! you set it straight or slant it as you please at seven, twenty-eight, or forty-five Degrees! It stops the Icy Blast, repels the Dusty Gust; it makes the Car run fast, it keeps the Parts from Rust. It keeps the Engine clean, it keeps the Tires sound, it saves the Gasoline, it makes the Wheels go round. With deep, despairing Groans our Rivals have to yield! Then buy the Car that owns this Ne Plus Ultra Shield!"

Sore tempted was Ronald, but heaved a Sigh
And quoth as he left that Hall:
"Nay, never a Motor I dare to buy
Until I have seen them all!"

And many and fair, aye, many and rare
Were the Cars that his Eyes had seen
When he entered a Store with a Rosewood Floor—
A Place for a Royal Queen.

Each Lamp that glowed in that bright Abode
Was pure as a Maiden's Tear;
The Curtains that rolled from their Rods
Were pink as a Bashful Ear. [of Gold

Of Onyx rich were the Columns, which
Were smooth as the Watered Silk,
And lighted through with the faint, far Blue
That shines on the City Milk.

And there in the Shade of its Roseleaf Hood,
At rest in a Corner snug,
A Car that was built for a Fairy stood,
Its Wheels on a Persian Rug.

A Squire rose up from a Velvet Seat
And beamed on the Worthy Knight,
And chanted his Tale in a Voice as sweet
As the Trill of a Lark in Flight:

"Rest, happy Traveler! Gaze upon the Car that's called the Oberon. A Beam of Light, a winged Flower, the Car that moves by Secret Power. What need to praise its Perfect Parts? Address it gently, and it starts. Just speak to it in kindly-wise, and swiftly, softly, off it flies. Without a Murmur, Creak, or Jar, as silent as a Shooting Star it drifts along the Fragrant Miles, and when it sees a Hill it smiles! A Thing of Joy and Love and Song, it sweeps along, along, along, transporting them that ride within afar from Trouble, Toil and Sin!"

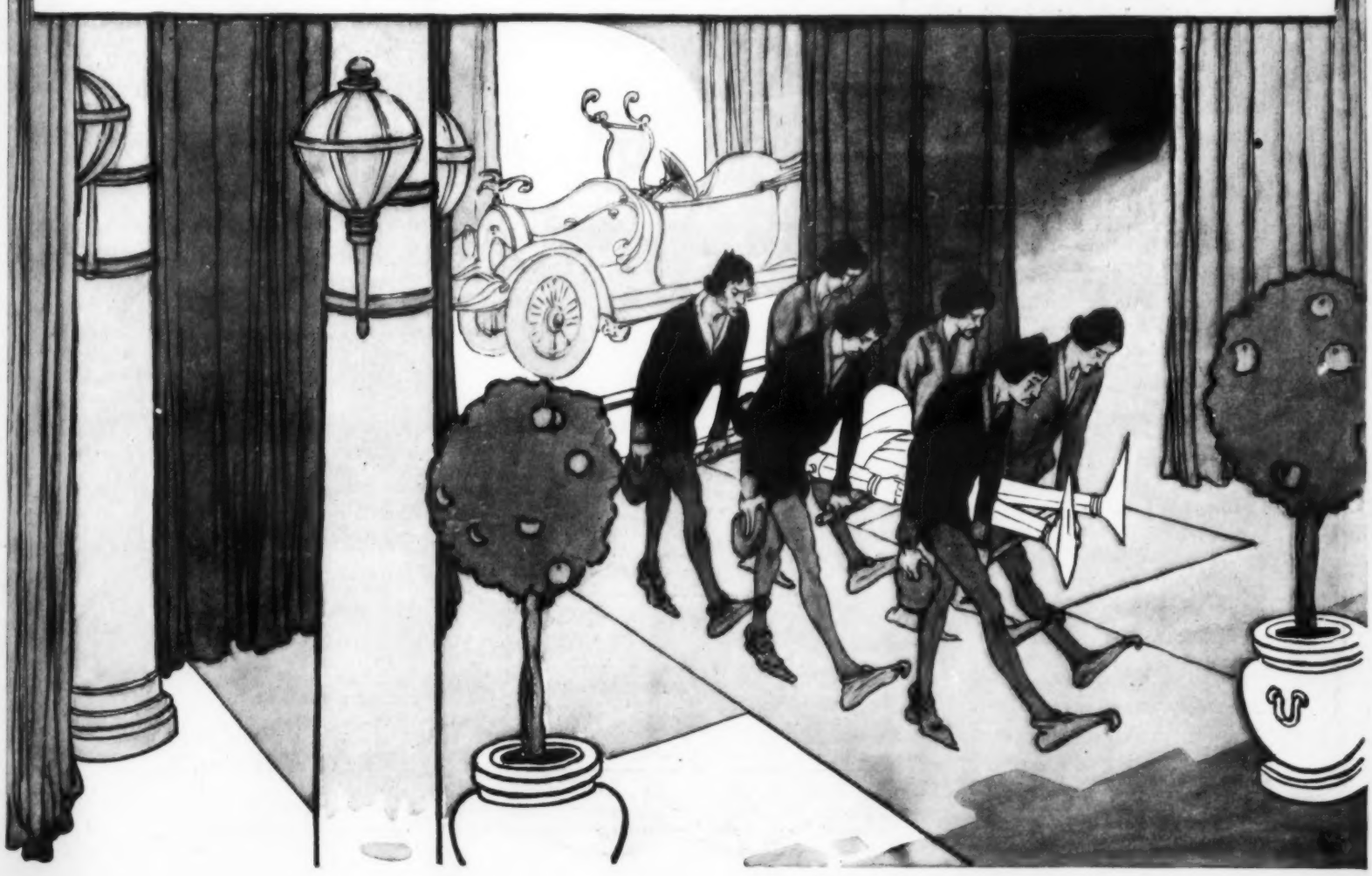
He turned on Lord Ronald his Eye so brown
And paused in his lilting Lay.
But Ronald had fallen adown, adown,
A-swooning in Bliss away!

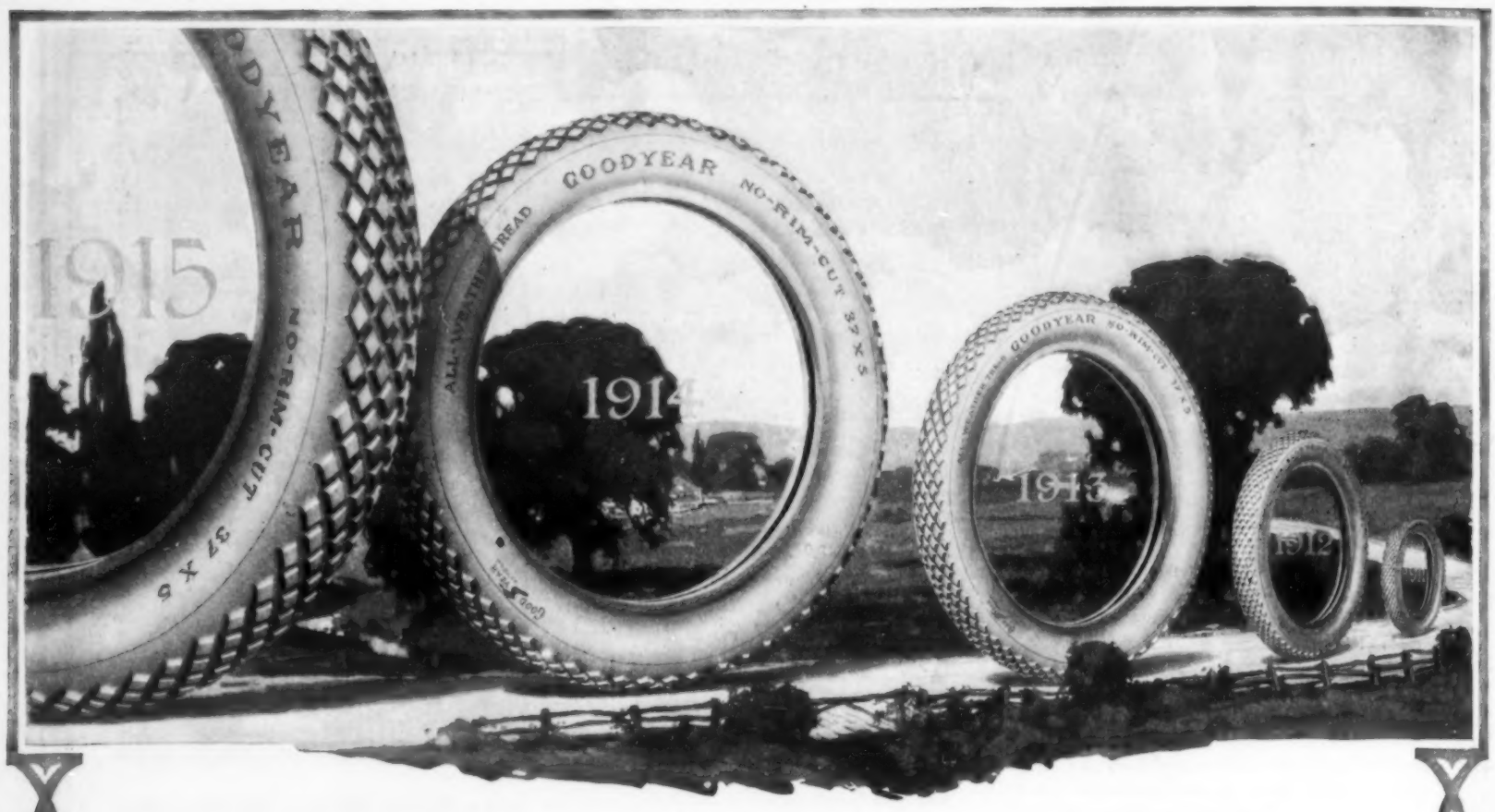
They gathered him up and they bore him
Six proper young Men and tall. [home—
He opened one Eye as the Stair they clomb
And sighed: "I have seen them all!"

They laid him to rest in his downy Bed
To comfort his weary Brain;
And tender and cool on his fevered Head
Was the Hand of his Lady Jane.

And long did he fare in the Realms of Dream,
Anew on his Knightly Quest.
And long did he ponder the Mighty Theme—
"Which Car shall be held the Best?"

He pondered the Words of the Motor Men
(Or Such as he could recall);
He visioned those Glorious Cars, and then
He rose and bought them All!





Note How Goodyear Grows As the Years Roll By

1,479,883 Tires Last Year

In the fiscal year just ended we sold 1,479,883 Goodyear pneumatic automobile tires. That's about one tire for every car in use.

• It was 26⅛ per cent more tires than we sold the year before. It was half as many tires as we had sold in our previous 14 years combined.

It was more per month than we sold per year back in 1909.

It is more than were sold of any other tire that's built.

To Men Like You

We sold these tires to men like you—men who seek quality tires. To men who want safety, strength and endurance. To men who watch tires and compare them.

Some had accidents with tires. Some misused and wrecked them. And some, no doubt, got faulty Goodyear tires.

But there's the record after 15 years—after millions of tests and comparisons. The final verdict, as shown by sales, is that Goodyear tires are best.

Fortified Tires Five Exclusive Ways

Goodyear Fortified tires protect you in five exclusive ways.

One combats rim-cutting in the most efficient way that's known.

One means safety. These tires are held on by an unstretchable tire base, in which we vulcanize six flat bands of 126 braided wires.

One saves needless blow-outs. Our "On-Air" cure—which costs $1,500 daily—prevents the countless blow-outs due to wrinkled fabric.

One—a patent method—reduces by 60 per cent the risk of tread separation.

And one combats punctures and skidding. That's our All-Weather tread—tough and double-thick, flat and smooth-running, sharp-edged and resistless.

All these features are in Goodyear Fortified tires. Not one of them is found in any other.

GOODYEAR
AKRON, OHIO
No-Rim-Cut Tires
With All-Weather Treads or Smooth

Let Them Prove

This isn't written to sell tires, for tires must sell themselves. We simply urge you to test the tires which won this matchless showing.

They outsell any other. They are gaining new users fast. They are fortified in exclusive ways against five major tire troubles.

You cannot, we argue, be fair to yourself without proving out these tires. And now, with the new year, is a good time to do it.

Any dealer will supply you if you say you want Goodyear tires.

THE GOODYEAR TIRE & RUBBER COMPANY, AKRON, OHIO

(2040)

THE WASTREL HORSE

THE INEVITABLE FUTURE TO THE MOTOR TRUCK

BY ROLLIN W. HUTCHINSON, JR.

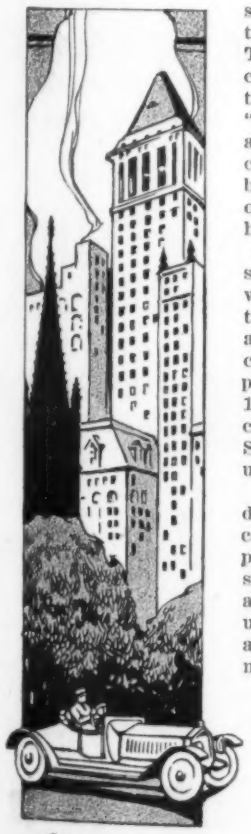
IN THE triumphant march of civilization and progress, machinery has almost supplanted muscle in every business but highway transportation and agriculture. The antiquity of the horse—the highway transportation tool—dates back thousands of years before Rome was at the zenith of its power. Man has been content to use the horse with no improvement in efficiency since the days when the Pantheon resounded with the philosophy of Plato, Sophocles, and Demosthenes.

The power of the horse has remained stationary in this day of big units in everything. When 75,000-horsepower steamships, 15,000-horsepower steam engines, 20,000-horsepower electric generators, 2,000,000-bushel grain elevators, 80,000-pound freight cars, and a single train that carries the grain grown on 6,000 acres are common, man still uses for the transportation of 85 per cent of the tonnage of the country an "animal motor" that is acknowledged by scientists to be the poorest motor ever built.

Let us analyze the reasons why the horse is the greatest economic anachronism of the twentieth century:

The horse's average consumption of food is 10 pounds for every hour he works, or a total of 12,000 to 14,000 pounds per year, which is the average production of 5 acres of average agricultural land in the United States. It costs from 75 cents to $1.25 per day merely to feed a large draft horse in average city service. If we put it at 40 cents per day as an average for the city horse, the individual horse consumes food alone valued at $146. It costs the time of the hostler, at an average of $2 per day, 27 minutes per day, or 20 days a year per horse, making a total of $40 a year.

To keep a draft horse in urban service properly shod averages $30 per year. The iron alone that was hammered by blacksmiths in the United States into horseshoes in the year 1912 was sufficient to have made 40,000 farm tractors or 60,000 motor trucks.



The cost of the veterinary service for the draft horse in the city averages $5 per year. The labor of the haymakers, corn growers, and the labor of the mechanics who make "horse-feeding machinery," and and the retailers of such machinery, is difficult to estimate, but a conservative minimum of this cost would be $50 per horse per car.

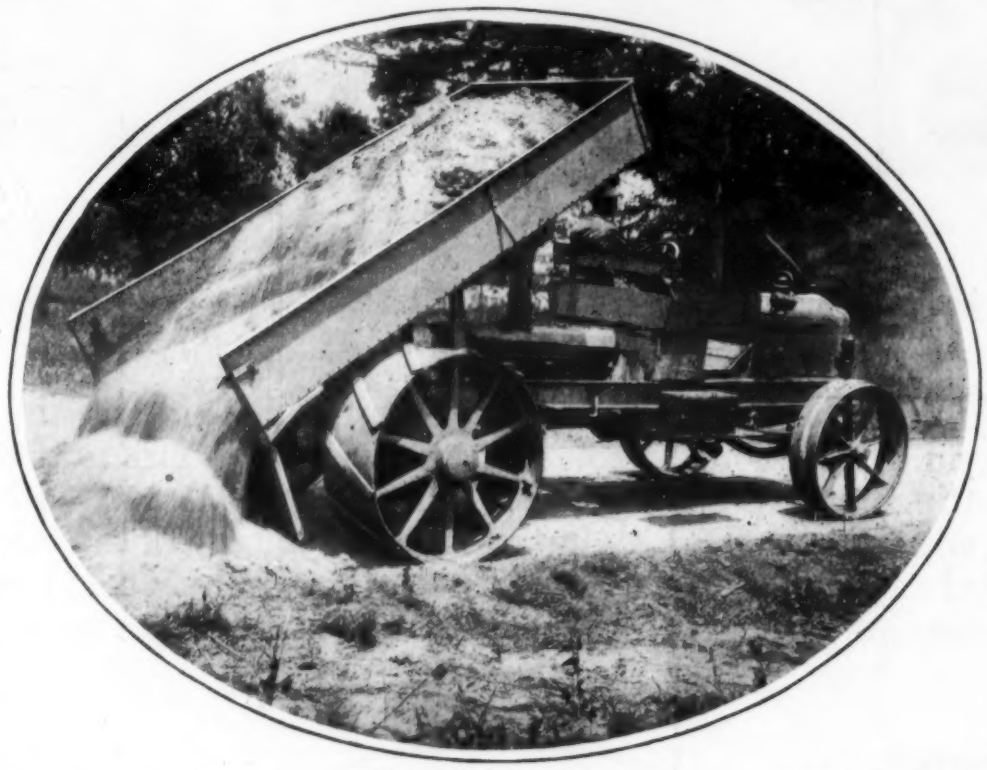
The labor of thousands of stable and street cleaners, which is made necessary by the use of the horse in city and country, is conservatively chargeable to $10 per horse per year for the approximately 10,000,000 horses used in the cities and towns of the United States of 100 population and upward.

The labor of the man who drives a team of draft horses can be safely estimated at $300 per year. The wagon (for city service) costs $100 (as an average) in small units. The upkeep of that wagon averages $10 per year. The harness costs $25 as an average for the city-used animal. Fire insurance on city horses and wagons averages $2 per year per unit.

The total of these by no means exaggerated figures is $850 for the upkeep cost of the horse vehicle for one year, which figure includes the feeding, the average first cost of the horse of $110, and a depreciation of 15 per cent per annum on his value. This is a minimum figure.

According to recent Government report, the horse averages but *four hours of useful work* per day in city service. For 300 working days, which is much above his average per annum service, his labor cannot be valued at much more than $3 per day, as this is the figure at which horses are hired by "horse contractors" to the public. But assuming that the horse's service is worth $3 per day (which is easily 100 per cent greater than its general average could be) for 300 days in the year, his total yearly service aggregates $900. We have seen that it costs $850 per year to realize this return from him; or itemizing:

Feed, $146; hostler or "nurse," $40; shoeing, $30; labor of growers of feed, makers of wagons, plows, etc., $50; driver, $300; veterinary care, $5; sanitary labor, $10; cost of horse, $110; cost of wagon, $100; annual repairs on wagon, $10; harness, $25; depreciation of horse and wagon, $22; insurance, $2; total, $850.



Building good roads in the South with heavy trucks. The wide cleat-tired rear wheels are needed for traction on soft country roads

The Horse Cost of Living

IN SOME businesses the horse's useful life is barely three years. But let us assume six years as a fair average and deduct his cost (but not depreciation) for succeeding years. This leaves $740 as the total cost of a horse-vehicle unit per year in city service. This cost of $740 is incurred on each one-horse wagon unit in city service, or a total of $7,400,000,000 for the United States on the basis that 10,000,000 horses are used in urban road commerce in places of 100 population and upward.

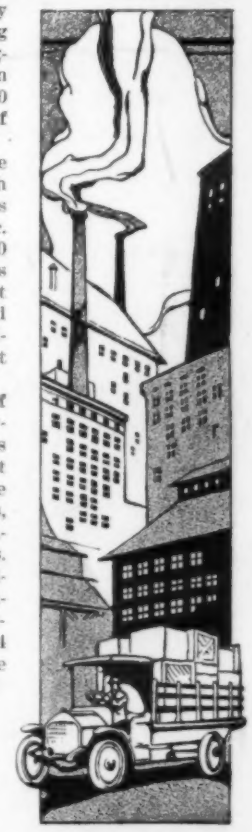
But this is merely the *direct* and approximately calculable monetary cost of the horse in cities alone.

The economic waste resulting from the feeding of 25,000,000 horses in the United States, taking the Government's estimate that one horse requires 5 acres of land for his upkeep, and the known fact that 5 acres of land devoted to food product can be made *to feed 5 people per year, we have an acreage sufficient to maintain a population of 125,000,000 people that is now being devoted to the growing of horse feed alone.*

The valuation of the "horse cost of living" per year for 25,000,000 animals, expressed in terms of 75,000,000 tons of hay at an average value of $740,000,000 per year, of $275,000,000 worth of oats, and $1,000,000,000 worth of corn, is for the whole country over $2,000,000,000 per year. In other words, our horse-feed costs for 1914 equaled the operating expense of 250,000 miles of railway in the United States.

The horse is a large space appropriator. For himself he requires 750 cubic feet of space. For his adjuncts—feed room, harness room, and wagon room—he requires an average of 2,500 cubic feet additional space; a total of 3,250 cubic feet of area, which in cities averages, as a minimum, an investment of easily 10 cents per cubic foot for housing the horse-vehicle unit. This means an investment of $325 for a city horse for stabling, plus a low minimum of $250 for the real estate—an investment of $575 for a horse-vehicle unit for housing; conservatively putting it at only 50 per cent of this, or $287.50, for 10,000,000 horses, a total of $2,875,000,000 investment for sheltering our "equine parasite" in cities, towns, and hamlets.

It is entirely truthful to say that if the acreage devoted to horse stables in the cities and towns of the United States were released for human habitation, or for the construction of industrial and manufacturing institutions thereon, it would easily become enhanced 50 per cent in valuation. That is, the housing space in urban centers would easily be worth $250 (in round numbers) per horse-vehicle unit additional, or $2,500,000,000. It is a well-recognized fact that all real estate in cities contiguous to horse stables suffers a 50 per cent depreciation as an average, and most of this acreage adjoins residential property. If we grant that the "horse-habitation" acreage if released for more valuable purposes will be appreciated only 25 per cent, the monetary or industrial valuation of real estate *invested* in and *depreciated* by horse stabling amounts to $3,593,750,000. In the "horse cost of living" we must figure also the value of the horses lost each year from natural causes, accidents, fires, etc. New York has an average of 20,000 dead horses per year; Pittsburgh, 11,000; Chicago, 7,200; Philadelphia, 6,000; Boston, 3,000. The total per annum horse mortality for the cities, towns, and hamlets of the United States is easily 400,000 per year. Valuing them at the Government's figure of $110 each, we have an additional sum of $41,100,000 to add to the "horse cost of living" bill.



It is impossible to figure the monetary loss that the death of these 400,000 horses causes in the disorganizationof traffic.

If we replace the 10,000,000 horses by mechanical wagons and automobile trucks, what will be their investment and maintenance cost in comparison with animal power? What will be the resulting gain?

The flexible adaptation of mechanical power to the service of city transportation as well as farm service makes it now practicable to displace 8,000,000 horses in cities, towns, and hamlets, and 4,500,000 additional horses on farms. It has been proved by experience that one mechanical business vehicle can do, at an average, the work performed by 4 horses. A fair conservative ratio is on the basis of 4 to 1; i. e., 4 horses being required to render the per diem service of one average motor truck, tractor, or other motor unit. Dividing 4 into 12,500,000,

This is the smallest of our eight gasoline models. Capacity 1500 lbs. Chassis price,

$1090

This is the largest of our eight electric models. Capacity 6 tons. Chassis price without battery,

$2500

YOUR haulage or delivery problem has features all its own. You are anxious to solve this problem of yours in the most satisfactory way. While the final decision rests with you, aren't you anxious to take what advantage you can of the information and experience of the largest company in the world building both gasoline and electric trucks? If you are, write us at once.

In some businesses electric trucks have decided advantages. In others, gasoline trucks only can give the required service. In still others, either gasoline or electric trucks can be used with profit. But there is a certain size truck, electric or gasoline, that is the **most profitable truck for you.**

GMC
GENERAL MOTORS COMPANY
TRUCKS

Gasoline *Electric*

G M C prices are low because of big production and low overhead expense per truck. Big buying power and vast equipment make it possible for us to build the best trucks we have ever built and sell them at prices that are lower than other high grade trucks.

General Motors Truck Company builds both gasoline and electric trucks in the most complete range of sizes yet produced. We have no prejudice in favor of any particular truck. Our one endeavor is to help you choose the truck that will serve you best. We can profit only by recommending the most profitable truck for you.

Our service plan actually co-operates with you to secure the results you desire in your delivery or haulage service. A letter from you outlining the nature of the work you have to do and the character of the roads in your locality, will assist us in giving you information of value. It would be wise to communicate with the nearest GMC dealer also.

Dealers: For the same reason that GMC Trucks are most profitable for business men to buy they are also the most profitable for the dealer to sell — Let us tell you why.

GENERAL MOTORS TRUCK COMPANY
One of the Units of General Motors Company
PONTIAC MICHIGAN

Direct Factory Branches: Philadelphia, St. Louis, Kansas City.

Direct Factory Branches: New York, Detroit, Boston, Chicago.

we find that 3,125,000 motor units, including gasoline engines and farm tractors, would perform the service of 12,500,000 horses.

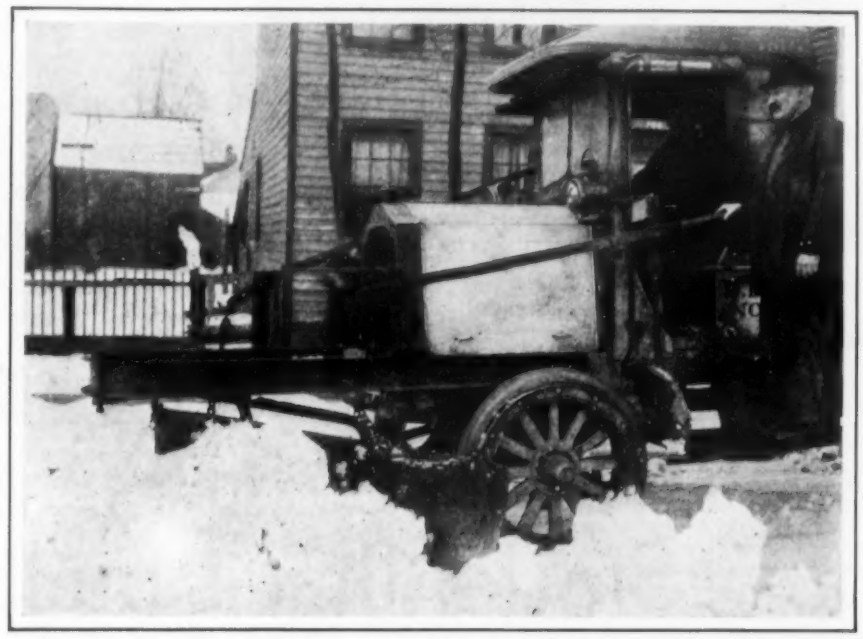
It must be frankly stated that if 3,125,000 motor units were to be substituted *all at once* for the horse system of transportation and farm labor, *nothing less than the sudden death of 10,000,000 horses would more seriously disrupt highway commerce*, the reason being that the business public would not know how to intelligently use the motor units. If, however, there were a demand for 3,125,000 mechanical wagons, tractors, etc., in the next six or eight years, the manufacturers *could create an educational force that would teach merchants and farmers how to use the new vehicle intelligently.*

These 3,125,000 trucks and other business motor units would demand an initial investment, at an average of $1,250 each, of $3,906,250,000.

The average operating cost per day of the mechanical wagon, figuring all items—investment, interest, depreciation, insurance, garage, rental, driver, tire expense, maintenance, gasoline, oil, grease—is, for a motor vehicle of 1,000-pounds carrying capacity, $4.75; 1,500-pounds carrying capacity, $5.80; 1-ton truck, $7.25; 1½-ton truck, $7.65; 2-ton truck, $8.05; 3-ton truck, $8.75; 4-ton truck, $11; 5-ton truck, $11.50; 6-ton truck, $12.25; 7½-ton truck, $12.50.

The general average of these various-sized motor units is $8.95 per day, as against $2.07 average per day for a single-horse unit. The mechanical vehicle, therefore, that does as much work in a day as four single horses, or two two-horse teams (costing $8.28), costs at an average 67 cents more a day to operate. The yearly cost of 12,500,000 displaced horse units, on the basis of $2.07 each per day, would be as follows: For the 8,000,000 that should be supplanted in the cities and towns (assuming 300 working days per year per horse) the cost would be $16,560,000 per day, or $4,968,000,000 per year. For the 4,500,000 horses that should be supplanted on the farm by mechanical power vehicles and tractors and power-driven machines, on the basis that it costs but one-third to maintain a horse in the country of what it does in the city, or, say, 75 cents per day (this figure including interest on investment, depreciation, insurance, value of land occupied, value of care, upkeep, etc.), we have an additional cost of $1,012,500,000 as the yearly tax for maintaining the agricultural animal power that can be more practically and profitably supplanted by mechanical agencies. Summarizing these figures, we have a grand total of $5,980,500,000 as the "horse cost of transportation and farm labor" in the United States that can be more advantageously—in economy, convenience, dispatch, efficiency, quality of service, etc.—replaced by mechanical units. This sum is one-half the total value of the farm products of the United States for 1914. It would pay for the 3,125,000 mechanical business vehicles, tractors, power engines, etc., and leave a surplus of $2,074,250,000.

Now, if we are disposed to be unduly fair to the horse way of doing things, let us assume that only 8,000,000 of the 12,500,000 horses will require a vehicular investment, and then take the average value of the one-horse passenger or business vehicle at only $35, or a total of $280,000,000. Deducting this valuation still leaves a $1,794,250,000 surplus after motorizing the muscular system. But let us stretch our fairness to the *elastic limit* and estimate that, due to undercare, wide variations of horse-feed cost in different localities, variations in driver's wages, etc., we should be more conservative and assume that the actual cost of the horse way of doing work is 30 per cent less than the 12,500,000 animals cost, or, instead of over five billion dollars, only some three billions. The motor system will still show a monetary economy if we are willing to grant that the economic value of the men released as hostlers and drivers on the basis of $150 average per year for 6,250,000 men, will amount to $937,500,000. Summarizing the total cost of 12,500,000 horses, the grand total exceeds four billion dollars. Let us compare the cost of motorized highway commerce with horse-vehicle transportation:



Out in Detroit they use a motor truck with a "snow-snoot" attachment for winter street cleaning. The truck works at night when traffic doesn't interfere with its operation

At an average of $5 per day per motor unit—tractors, trucks, internal combustion-driven appliances, etc.—the per diem cost of operation of 3,125,000 motor units would be $15,625,000 a day, or $4,687,500,000 for a year of 300 working days. By motoring *some* of our road transportation and farm labor we would save $338,000,000 a year, sufficient to pay for the transformation to motors in a trifle over ten years.

Scrapping the Noble Horse

BUT to approach the subject on a real business basis we would have to provide a "sinking fund" to pay for the discarded horses, wagons, harnesses, etc.

It has been shown that the valuation of horse stables, plus enhancement of the amount of the land they occupy if used for better purposes, equals for the whole country about $3,595,750,000. In our estimate of daily expense for the motor unit, we have included the per diem rental cost of the garage space for the motor unit, but have not estimated the direct monetary value of the real estate and buildings 3,125,000 motor units would occupy.

The motor truck, tractor, or other mechanical horsepower substitute is a complete, *self-contained* unit. Its "feed," if driven by the internal combustion type motor, can be kept underground in tanks. As an average, *five motor-vehicle units can be garaged* in the same cubic space needed for one horse, wagon, and its adjuncts. But to be as liberal as possible to our horse unit, let us take one-quarter of the space as the amount of area needed for the sheltering of the motor unit, or an average of 812 cubic feet, which for 3,125,000 motors equals 2,537,500,000 cubic feet.

As horse-vehicle transportation or farm-labor units consist largely of "two-horse units," we will be generous and estimate that 2,250 cubic feet is a fair average for the housing space demanded by each of the 12,500,000 horse units. This gives some 30,000,000,000 cubic feet of space as the housing area required for the horse system of transportation and farm labor—an area *more than twelve times that demanded by its equivalent in motor units.*

The enormous economy in the space required for the motor, which space is becoming increasingly valuable, is further intensified by the fact that the motor unit can be housed wherever it is practicable within reasonable limits. The motor unit has no element of fatigue, and its speed being two to six times greater than the horse unit, it can be sheltered, if a motor truck, five to twenty miles away from the point where it must begin its work, and in localities where real estate may be one-half to one-quarter as valuable. If the horse-housing investment of the country is $3,595,750,000, the motor-housing cost would easily be one-half less.

Thus a saving of $1,438,300,000 would be gained from the value of the space now occupied by our 12,500,000 "economic anachronisms."

Taking the Government's estimate of $110 as the value per horse unit, we have a total of $1,375,000,000 as the value of the horses that would be displaced by mechanical agencies. Estimating that 8,000,000, or the ought-to-be-displaced, horses pull 4,000,000 wagons, and that a very fair average to take as the value of each wagon is $50, we have $200,000,000 to be accounted for in a sinking fund on the purely vehicular end of horse transportation.

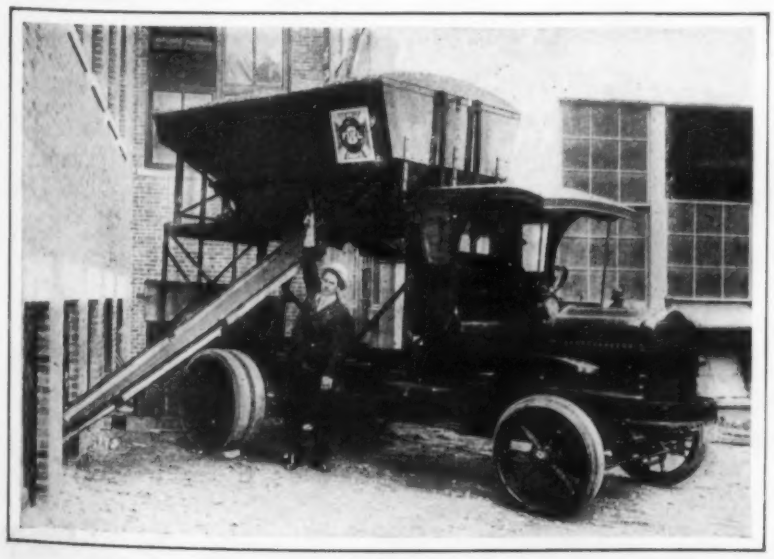
At $5 for harness per horse, 12,500,000 horses would require an additional sinking fund of $62,500,000; for stable blankets, brushes, etc., a very low estimate of 50 cents per horse would mean an additional $6,250,000.

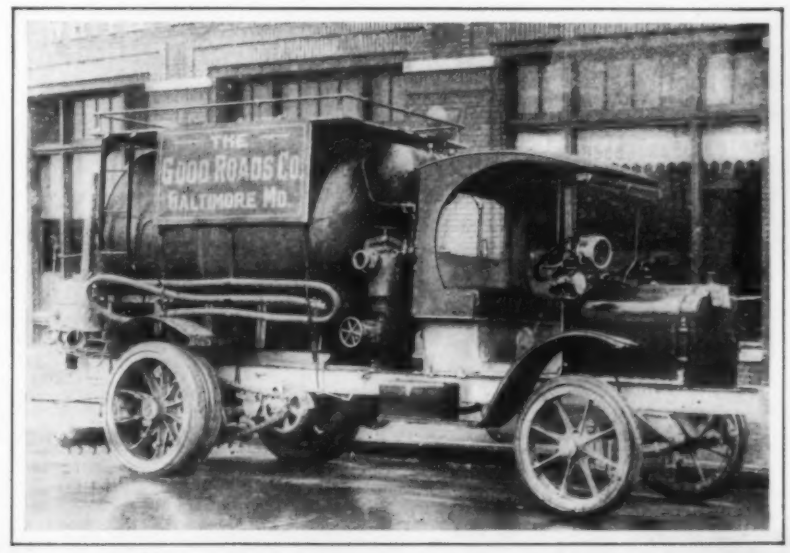
The aggregate value of the 12,500,000 of the 25,000,000 animals is, therefore, $1,643,750,000.

Reasonably and justly we can take this sum from the $1,438,300,000 which the motor system would save in property values to reimburse ourselves for the discarded horse system and still be $205,450,000 in pocket.

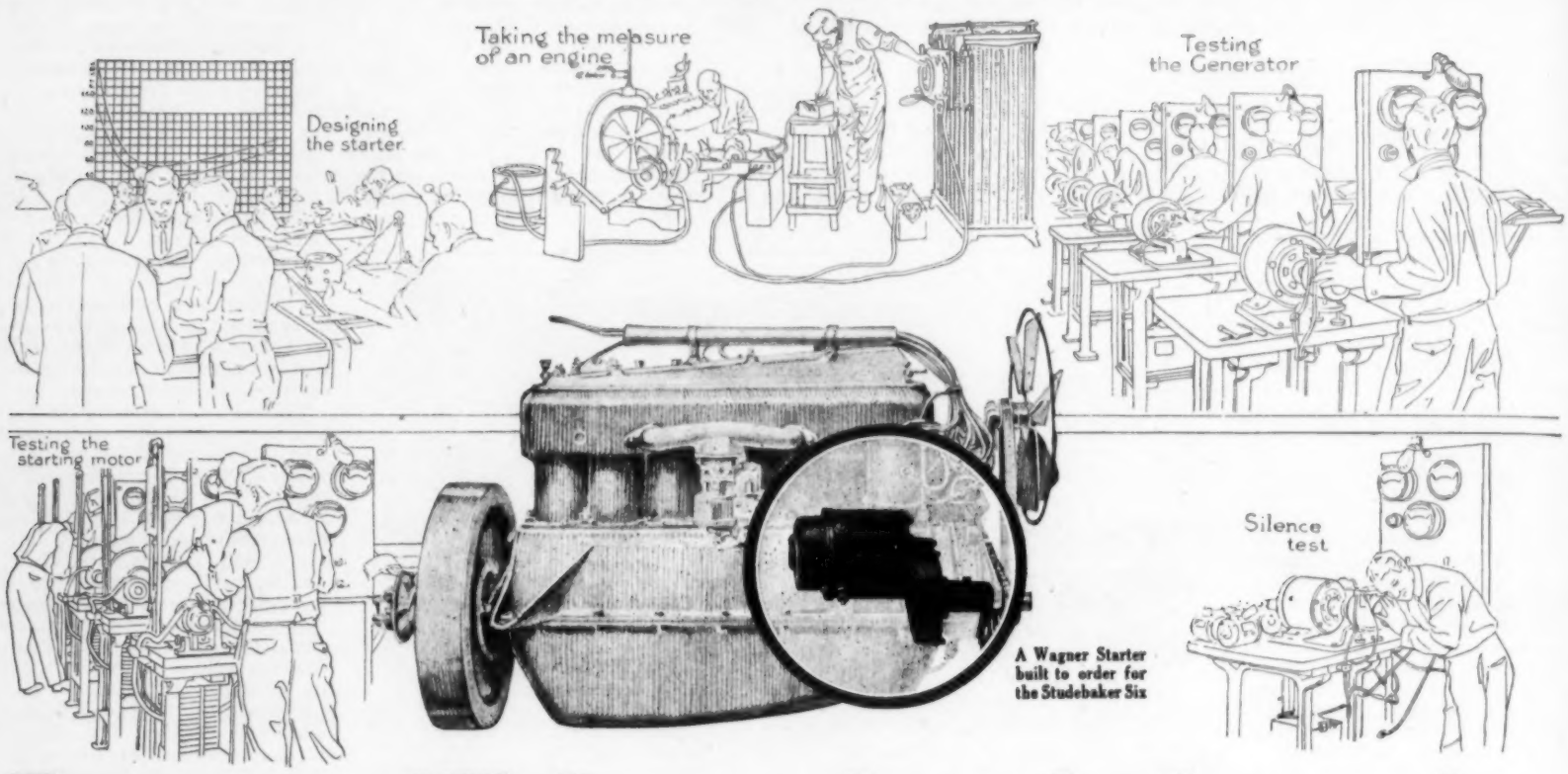
But let us be still fairer to our noble friend the horse and assume that consistently we should apply the saving per annum of the motor system as the sinking fund to pay for the discarded agency. On this basis the $1,438,300,000 valuation of the horse system would be liquidated by the $1,057,500,000 annual economy of the motor system in less than one and one-quarter years.

To absolve ourselves of any accusation of prejudice or bias, we have not included in the horse-valuation figure above the "scrap value" of the 12,500,000 horses for human consumption—as meat, bone, fertilizer, soap, tallow, leather, glue, hair, etc.—which, on the low basis of $15 each, would increase by $187,500,000 the valuation of the horse system.





The motor is equally valuable in building good roads and in using them to best advantage. Modern coal delivery means merely placing a motor truck alongside the unloading point and pressing a lever or two. The right hand photograph shows a large road truck from which liquid material is pumped by the truck's own engine


Taking the measure of an engine
Designing the starter
Testing the Generator
Testing the starting motor
Silence test
A Wagner Starter built to order for the Studebaker Six

The start of The Starter that is built to order.

The Wagner Starter initiates with the car-builder's good judgment when he designs his car. It is never an after thought. It is never built and added to a completed car. The fundamental idea back of the Wagner Starter is that it must be built to order for the car it is to start.

The car manufacturer and the Wagner engineers work together. The engine is designed with proper provision for the location of the starter. An engine is built and turned over to the Wagner engineers, who proceed to measure the engine's cranking requirements under all conditions. From this exact knowledge they design and build a starter that is perfectly suited to that particular type of engine.

The man who buys this car has the same feeling of satisfaction with his starter that he has with his perfectly tailored suit—both are made to order, and both show to the best advantage.

The Wagner Starter

is built by expert engineers who have had 24 years' specialized training in the development of motors, generators, transformers, converters, rectifiers, and electrical instruments of precision. Their skill has made the term Wagner, Quality the sterling mark of the electrical world, and it has made the Wagner Company third in size among the great electrical machinery manufacturers of America. Everywhere, from the largest central lighting and power plants, down to the smallest factories, you will find Wagner motors and other Wagner, Quality apparatus doing efficient work. It must be evident that a Wagner Starter designed and made by such an organization must be right.

Wagner Quality

The story of the Wagner Starter and the great organization behind it is interestingly told in "The Starter That is Built to Order". Write for a free copy.
If you are interested in motors, either single-phase or poly-phase, generators, transformers, converters, rectifiers or electrical instruments of precision, Wagner, Quality and Wagner Service, will have a definite meaning to you. Confer with the nearest Wagner Branch or write

Wagner Electric Manufacturing Co. St. Louis, U.S.A.

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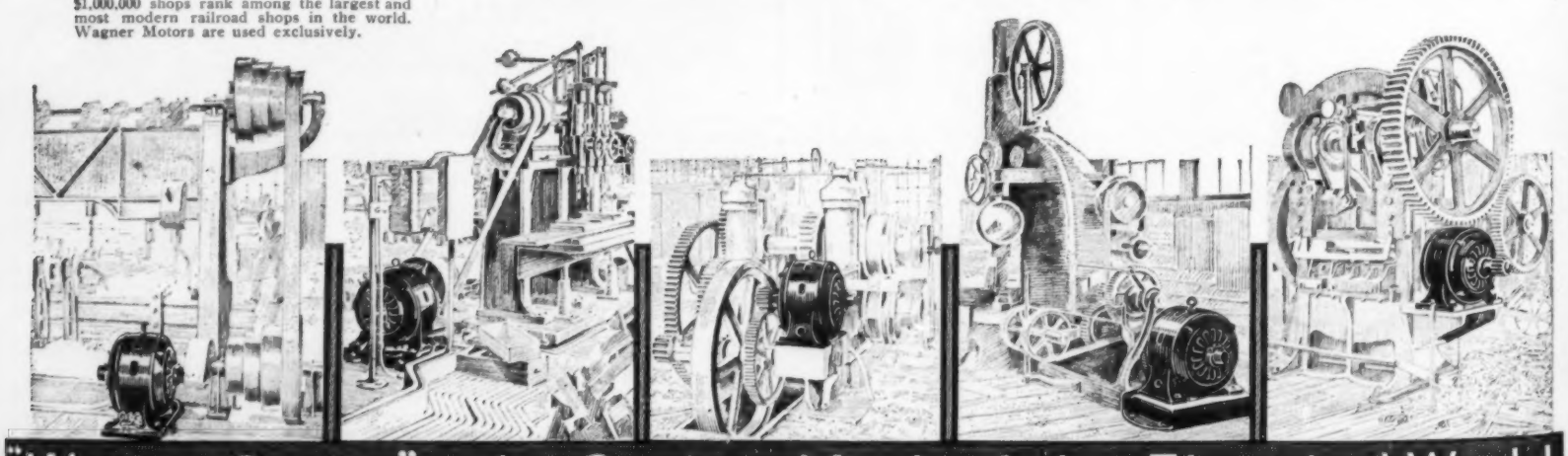
Toledo	Detroit	Chicago	Milwaukee	Minneapolis	
St. Louis	Kansas City	Los Angeles	San Francisco	Seattle	

Selling Agencies: Reading, Pa., Richmond, Va., New Orleans, Sioux City, Denver, El Paso, Salt Lake City, London, Eng.

These illustrations show a few of the Wagner Motors operating machinery in the gigantic Wabash shops at Decatur, Ill. These great $1,000,000 shops rank among the largest and most modern railroad shops in the world. Wagner Motors are used exclusively.



"Wagner, Quality"—the Sterling Mark of the Electrical World

The enormous yearly saving which our motorized highway commerce and mechanical, instead of muscular, farming would insure would surely be reflected in cheaper food, cheaper clothing, and cheaper manufactured products of all kinds, as the rapidity of the motor unit, coupled with its greater carrying capacity—the *new standard of efficiency* (which it would soon teach) in transportation and agricultural production—would enable the unit cost of transportation on anything to be quartered or halved.

The motor system of transportation would be put on the same high efficiency basis as other departments of business, eliminating the multiplication of rehandlings (aggregating twenty-three in Chicago) by taking products direct from farm to consumer and from manufacturer to merchant. Motor express systems, conducted like the railway express companies, and distributing food products and merchandise and acting as common carriers, would eliminate the enormous tax we now pay by duplication of each individual merchant's delivery to our homes in the suburbs. The economic gain to the country by the substitution of the motor for the horse in cities *would have a value in human lives which cannot be measured in money units.* We know how increasingly difficult it is to maintain our congested cities in a sanitary condition. The horse and the house fly are inseparable companions, and where the house fly breeds in sufficient quantity, typhoid fever is a probable result. Typhoid fever kills and maims tens of thousands in the United States every year, and while we cannot place all this economic loss in population upon the horse, we know that nearly 100,000 people, valued economically on the basis of $8,000 each, are destroyed yearly by "horse-caused diseases." Besides the $800,000,000 productive capitalization which the destruction of this number of human beings represents, their loss to industry in the creation of collective wealth has a certain economic bearing.

The economic waste of the horse is a problem bigger in its bearing upon individual and collective wealth and upon the rising cost of living than the tariff, the middleman, the appreciation of gold, the influx of agrarian population to cities and what not. It is an *unrealized, unknown source of waste.* Why?

It is distributed over 95,000,000 people, and its amount per unit of population is as undeterminable as the percentage each of us contributed to another economic loss—the billion-dollar consumption of spirituous liquors in the United States in 1912.

For instance, precious few of us figure the cost in the crudest way of the cigars he smokes in a year. So, likewise, we do not figure horse cost individually. In spite of the fact that the horse has advanced 143 per cent in cost in ten years, and his feed 125 per cent, nine-tenths of the greatest business houses in the United States that can tell one in four-point decimals their selling costs per day, per month, or on any other basis, can with truth only say of their transportation costs: "I do not know."

Few of us realize that the horse in the city and, to a large extent, on the farm, is now an economic anachronism.

Custom has sanctioned horse methods until the horse system of transportation has become an economic crime. As Mr. Herbert N. Casson, the well-known industrial economist, says, "the horse is to-day an unprofitable servant." We are using him mainly for two reasons: (1) Because we are not yet ready for the new machines which have been invented to take his place; (2) because we still have the horse habit; our brains are accustomed to think in terms of horsepower and to cling to the horse idea. We still look upon the horse as an indispensable helper both in the city and on the farm. We are ripe for a power revolution in city and country. It is coming fast. By 1915 there will be nearly 125,000 mechanical business vehicles in service and 60,000 farm tractors in the United States alone.

The European war is now destroying horses by the thousands. These horses are the finest that intelligent breeding and money can produce—horses that cannot be replaced except by years of patient waiting and the same selective processes of breeding which resulted in the wonderful perfection of horseflesh in Europe. Europe will call—has already called—on the United States for many shiploads of horses.

If the war lasts a year longer, the equine race will be practically exterminated in the present large theatre of war. The restoration of peace and the arts of agriculture which must be restocked with horses will bring constant demands from America for horses for years to come. Horseflesh, we predict, will increase from 25 to 100 per cent in the next two years. This means that the merchant—yes, even the farmer, will be forced to come to mechanical agencies—the motor truck, the tractor, and the internal-combustion engine—to do his work.

The whale of the modern highway. This motor truck is the largest in the United States, measuring 29 1-2 feet in length over all. It is 8 1-2 feet wide, but the truck's capacity is only 6,000 pounds

The day of the motor vehicle—passenger and commercial—has only really begun; inventive genius is finding several satisfactory substitutes for gasoline. Most of the *modern* trucks will gasify alcohol, kerosene, and distillate in addition to the standard fuel, gasoline; and, by popular action, users of internal-combustion-engined vehicles could induce our Government to reduce the present tax on alcohol, which would make it practicable for every farmer to manufacture his own fuel, and alcohol might become as low as five cents per gallon. We know that millions and millions of gallons of alcohol could be made from the organic refuse which annually goes to waste in this country.

Waging War by Motor

THE power wagon and its consort, the passenger motor car, have played a rôle in the present European war such as even the most enthusiastic military men did not dream of in the past few years of perfection of motorized land transports with which the War Departments of France, Germany, and England have been engaged. So vital was France's faith in the value of motorized transports for troops and provisioning for armies that within twenty-four hours after war was declared there were no motor omnibuses operating on the streets of Paris, and exceedingly few taxicabs or even privately owned passenger vehicles. In ten days after the declaration of war nearly 19,000 power wagons and 50,000 passenger motor cars had been commandeered by the French War Office.

France perfected prior to the war the most scientifically organized system of subventions on power wagons of all the nations of Europe. As far back as 1897 the Automobile Club of France originated the forerunner of the French War Office's present subsidy system. In 1906 the French Government took over the annual trials, establishing a system of subsidies whereby the purchaser of a motor truck of a make which had successfully withstood the tests and received a certificate is paid an initial amount of approximately $540 as soon as he has proved that he has purchased a subvented make of truck, and an annual bonus of approximately $208 per year for three years thereafter. A proviso to the purchaser makes it imperative for the owner of a French subvented motor truck to immediately turn it over to the Government in time of war at a stipulated rental per day and the incurrence of a liability by the French Government to reimburse him for damage or loss of his machine.

Through these subsidies the French Government had acquired, subject to immediate demand, a fleet of between five and eight thousand power wagons.

The German War Office established a subsidy system in 1907, but the number of subsidized German trucks is comparatively small, due to the fact that motor-truck industry in Germany has not yet attained an appreciable importance, as Germany is a rugged country, and its steep grades, despite relatively fine road system, have not brought about such a popularity as the motor truck possesses in France and England. However, Germany, up to March, 1913, had subsidized about 850 single-unit power wagons and owned some 87 tractor-trailer trains; these road trains, consisting of a four-wheel driven type of truck, capable of pulling from eight to twelve loading trailers of approximately the same capacity each as the towing or "locomotive" unit. It is safe to say that if all of the 9,635 motor trucks which were in service in Germany up to April 1, 1914, are needed, everyone will be requisitioned by the German War Office for the transporting of troops, supplies, artillery, aeroplanes, ammunition, ambulances, airship guns, field kitchens, field hospitals, and what not. The list of applications of power wagons and passenger cars in the European war includes, in addition to those detailed in the previous sentence, every service in which wheeled vehicles drawn by man or animal power have been heretofore used. Horses have been employed to a large extent because, in spite of the many thousands of available motor trucks of the three Great Powers, there have not been enough to move the tremendous tonnage of modern munitions of war; hence, as we have stated, horses have suffered most because in the swift movements of modern armies, coupled with the powerful long-range artillery, the power wagon and passenger car could get out or keep out of danger and offer less conspicuous targets than have horses, which have served to a horrifying extent as the principal "food for cannon." Thousands and thousands of power wagons and passenger cars have been ruined, wrecked, and destroyed, and if the war continues a year not likely more than 10 to 20 per cent of the machines in service initially will be left in running condition. Shells and mines will destroy more than probably will service. At this writing the Allies are purchasing motor trucks in large quantities in the United States, and the continuance of the war for a year will mean that America must become *the producing source for both types of motor vehicles.* When peace is restored, relatively speaking, the power-wagon industry will receive a much greater impetus in proportion than will the passenger-car industry. The impetus will be far-reaching, in that decimation of horses will inflate prices so greatly the American business public must come to motor wagons; and of all industries, the motor-wagon business will, in proportion to its present importance, be stimulated most by the European war.

War is a terrible test in which a new transportation tool must prove its efficiency, but the European war will live in the history of the motor truck as the greatest of all incentives to its popularity.

Beating out the middleman: how the up-to-the-second farmer finds new markets with his motor truck

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3200 Revolutions Per Minute

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It gives a smooth turbine-like stream of power which may be used to propel the car at any speed from one to sixty miles an hour on *high gear,* making gear-shifting practically unnecessary. The car as a whole is in keeping with the motor quality.

Specifications in Brief

Unit power plant, 3-point suspension, 6-cylinder 3½"x5" en bloc motor, actually developing 55 brake horsepower. 121-inch wheelbase.

Left-hand drive, center control.

Weight, 2950 lbs., giving more than one horsepower to every 55 lbs. of weight.

Leece-Neville separate unit starting and lighting system. Ignition from storage battery through distributor and coil.

Economical Rayfield carburetor.

Vacuum gasoline system with gas tank at rear of chassis. Splash and force feed lubrication.

Forced water circulation.

Clutch, three-plate dry disc type lined with Raybestos.

Transmission, selective sliding gear type, three speeds forward, one reverse.

Haynes *full floating* rear axle, axle shafts, pinion and pinion shaft nickel steel.

Exclusive arch frame construction, with 54" elliptic chrome vanadium steel springs.

Crowned Fenders.

Low center of gravity and long sweeping body lines.

34 x 4" tires, Firestone demountable rims.

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Stewart-Warner Speedometer.

Improved one-man top, Collins curtains.

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A HICK RACE

BY WILBUR HALL

ILLUSTRATED BY R. M. BRINKERHOFF

WHEN I first begun driving road races I promised Peggy I wouldn't gamble on those I was entered in. I would of promised Peggy anything she asked me to, of course, but she didn't have to crowd me none about that betting business. I've seen it put the razmataz on too many fellows and too many man's-size sports not to be leery of it. Since I been driving I kept my promise—all but once.

That was when I and Adolph Stearns was driving for Old Man Polentz in California. Polentz was potash king, or dried apricot king, I forget which—they's lots of kings like that out in southern California, and some princes, too, I don't mind saying—and a few queens—well, and Polentz was nuts over road racing.

He had two Apexes built to order, and I never seen sweeter cars on long grinds than the pair I and Adolph had. Polentz entered all the big races—Indianapolis and Elgin and Santa Monica—and even out at Corona, and smaller ones like that—and we always figured on horning into the money with at least one of the cars about as regular as getting a shave. We got good pay, and the newspaper guys were always decent to us, so we had it pretty soft.

Except driving in the hick races. That tied my Angora up and had it blatting for help! Old Man Polentz hated to see a dinky little two-hundred-dollar purse get away from him. He fell for them all. So I and Adolph would just about get a alcohol rub and have our ears quit buzzing from the exhaust roar when along would come Rubeville or Ricketty Center, or some other place down on the edge of the map, with a road race, and we'd have to tune up and hike.

KEEP your muffler closed—I'm coming to the gambling story! The reason I got telling about the squash belt was because it was a country race that made me forget promising Peggy about gambling on my own driving. I and Adolph had just taken second and fifth money at Santa Monica, and we was both ready to grab a little rest down at the beach with Adolph's wife's folks when Old Man Polentz heard about the Imperial Valley road race. It was to be four laps on a sixty-two-mile course—I think that was it—free for all, and two thousand dollars in the purse, one thousand to the winner, and second and third splitting the rest sixty-forty. I wouldn't of gone across the road to pick up any of that money if I'd of been the old man, but he was all swelled up about winning two places in the Santa Monica, so he wished this Imperial Valley rabbit chase on we fellows.

Peggy went down to the train to see us off—me, that is. She don't like Adolph because he chews tobacco. But Adolph's white, what I mean. Peggy'll get used to him. Well, I started to say, she comes down to the train to give me last tag, and I springs a surprise on her. She like to fainted. It was a diamond ring—I got it out of a little wad Polentz slipped to I and Adolph for winning at the beach. I slid it on her finger—oh, I knew which one it goes on, all right! She's a peach of a little girl, Peggy is. You know—game and pretty and cook!—say, she's the girl that put the O. K. in cooking! Ha-ha!

Old man Polentz sent the cars down overland by San Diego with our mechanicians and a couple of boys for the pits. He wasn't going with us, but he came to the train, and the last thing he said was: "Don't fool away any spare time down there after you get the gun, boys, because you've got a kid named Steve Ryan to beat. They tell me he's got every chuck hole in the course named like a Pullman car. Drive his wheels off in the first lap! Don't take any chances. I want that money, d'ye understand?"

"Ryan!" I says. "Ryan! What does he drive—a hearse?"

"He drives a wreck that used to be Barney Oldfield's Green Dragon in the time of the Civil War. It may fall to pieces," he says, "but if it don't you fellows got to hurry to beat it. This boy Ryan has been working out for this race for three months, and his old Peerless takes the turns when he says gee and haw. I'm not rubbing it in, I'm just telling you about it," he says. I wasn't paying much attention—I've heard about these hick-race drivers before, and, anyway, Peggy liked that ring awful good. Peggy, she is one swell little—

WELL, we had two lowers in Car Three, and when we went in, there was a skirt in my section. She was reading a magazine, but I saw her piping me off. She didn't look at Adolph at all. He's a white fellow, Adolph is, and they don't make better race drivers, but he'd have to have about two laps handicap if he went into a beauty contest. Peggy says I'm the handsomest man driving road races, but I guess she's kidding herself a little, maybe. Anyhow, just after the boat pulled out, the skirt put down the magazine and tried to open the window. It had a new-fangled catch on it that must have been invented to use on bank vaults, and the little girl couldn't quite cut it. So I done it for her. She was a pretty good looker—awful tanned, but I like them tanned some.

"Get him to sell that old boat and buy a baby carriage"

WE HADN'T been talking long before Adolph—he had been sitting across the aisle—grunted like a tire blowing out, and went up to the smoking compartment. My friend gave him the once-over and then she says:

"Do you know him? Isn't that Adolph Stearns, the road-race driver?"

I says yes, that was Adolph. "How did you know?" I said. Then she looked at me quick and said: "Ain't that funny? I didn't know you before, but now I do—you're Bob Brooke."

I said yes, how'd she get wise to us, and she says: "Oh, I know all the drivers. I got a friend in the valley is a driver. I'm going down to see him pan the other entries Saturday. Are you and Mr. Stearns going to drive the Apexes? Well, you better turn back," she said, "because my friend'll beat you so bad they'll have to close the Apex factory!"

Well, she was this fellow Ryan's girl—and if he could drive as well as he has good taste in skirts, he'd be some driver, take it from me. She said they were going to buy an engagement ring and three hundred dollars' worth of furniture out of the prize money, and the rest they were going to use so Ryan could go to Corona in March and get into the racing game right.

I kidded her along, and she told me all about Ryan. It seems like he was a rancher there—he and his brothers—and they had a little money from barley or watermelons or something. Somebody had taken that old Oldfield plow down to San Diego, and this kid and his brother had bought it for the first couple verses of a song, I should guess, and they fixed it up with wire and string and painted it with some paint left over from finishing the courthouse or something. "Helen Blazes tunes up to a hundred an hour even on the valley roads, which ain't exactly a boulevard," the girl said.

"Hell and Blazes?" I said to her. "What kind of a name is that?"

"That's what Steve calls it," she says, and I says, that's a funny handle, but she says, no, that's the way the car goes.

I said: "Adolph's Apex isn't any sewing machine, but mine can drive rings around him and make him like the smell of the smoke. So I guess we'll both about leave Helen Blazes sitting in the road somewhere like two cyclones passing a chicken house."

"Huh!" she said, as near as I can spell it. "I'd like to bet you that Steve'll beat both of you the first lap by three minutes!"

Adolph had come back and he couldn't stand it any longer, so he comes horning in then. "This is Mr. Stearns," I said, "Miss ——" The girl gave Adolph a smile. "Miss Chase," she said. And she shook hands with him, though she hadn't with me. What any woman can see in Adolph has me taking the count. Well, you can't tell about these women.

MISS CHASE told Adolph that she was just going to bet me her friend Steve Ryan would beat us both the first lap. Adolph is a slow kind of fellow—Germans don't get up much speed anyway—and he just said: "Is that so?"

"I think I'll take you up, Miss Chase," I said. "How much do you want to bet?"

"If I had it I'd bet three hundred dollars," she said. "That would be enough to furnish the house."

"What house is that?" Adolph said. I don't see what he wanted to bore in for anyway. But she went on and told him about the engagement ring and the furniture they were going to get—I mean her and Steve Ryan—with the prize money.

Adolph says: "I couldn't take that money, Miss, because that would be a shame. But you bet Bob here, because his car's only got one lung, and your friend Steve might beat him at that."

That was a nice thing for Adolph to do—knocking his own team mate, wasn't it? But I didn't say anything. I stand a lot from Adolph, because I think fellows driving in a team ought to be friendly, and Adolph's white, what I mean.

"Why," I said to Miss Chase, "I'll bet you a good box of candy I beat your friend the first lap, no matter what place I draw! Is that fair enough?"

"You're on," she said, and then the porter came, and Adolph and I had to go in the smoking compartment to get out of the way. But I slid the nigger boy a dollar and told him to put the lady in the lower berth and I'd take her upper. I don't care about lowers, anyhow, and I was afraid Adolph would think of it and give her his lower.

When we were smoking Adolph said it mightn't be a bad idea to size this fellow Ryan up, because you never can tell about some of these rube drivers who know the road. But I had already got a scheme, so I let Adolph fume along and didn't say anything. He's about a twelve horsepower Ford when it comes to thinking up something slick, anyway.

The next morning Miss Chase got up early, and when she come back in the car I was just putting on my pants, and I had hit myself a helluva crack against the roof trying to do it, too, so I was lying back, cussing. I heard her say: "How do you do, Mr. Stearns; it was awful good of you to let me have your lower berth last night," and Adolph never batted an eye. "Don't mention it," he says. Now, what do you know about that? I was so mad I caught my foot in one pants leg, and when I kicked I hit the roof and pretty near broke my big toe. That's what comes of having a German racing partner!

There was a big crowd at the depot in the town where the race was to start—Brawley it was—to meet the train. I don't care about that sort of thing myself, but Adolph likes it, and so I let him get most of the cheers. Then a young fellow in a leather coat with goggles and a helmet on, came out of the mob and they began to cheer him, and I knew it was Ryan right away.

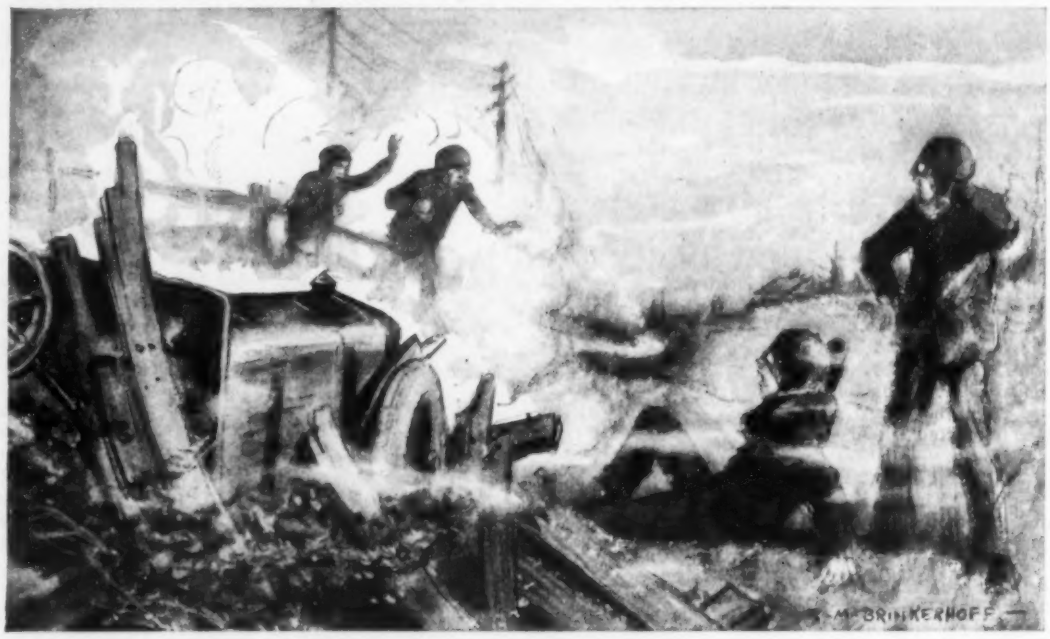
HE SAID: "I'm glad to see you fellows, and we'd better look out or he'd trim us Saturday." Then he spotted his girl, and the way she made a fuss over him gave me a pain. He wasn't such a good-looker, but women always fall for a racing outfit, like they do for a soldier or a sailor. I and Adolph had on just our regular clothes.

He introduced I and Adolph, and we said, thank

you, we'd met the lady, and then she told him about betting me a box of candy he'd beat me the first lap. He said that was easy, why didn't she make it a house and lot, because they could of used a house and lot in their business. And then she said: "Oh, hush, Steve," and when she blushed that way she made me think a lot of Peggy. Peggy's some queen, what I mean.

Adolph and I went to the hotel, and afterward we went down to the garage where the mechanicians had took the cars. They were looking pretty good, but my engine missed a little when I turned her over, and I tinkered with the magneto quite a while. It wasn't the box of candy, but I didn't like that girl from the bushes laughing at a good driver like me.

Ryan came in pretty soon, and then I began to work my scheme. I asked where was his car, and he said: "Come on and give her a squint. Helen Blazes was in the back of the same garage. Everybody in racing knows the old Peerless Green Dragon, but I had a good laugh when I saw her. Nobody would hardly of known her the way those boys had her fixed up. She was stripped to the chassis. They'd taken off even the old foot rail, and had two little iron cleats put on the edge of the dash. They had their extra casings on top of the gasoline tank instead of behind, and the steering-wheel shaft had been made over so the wheel was lower. The seats were just two cigar boxes about eight inches high, and they had gunny-sack cushions. I guess those boys had experimented to see how many bolts and nuts and things they could take off without the machine falling to pieces on the floor. I never saw a car stripped as clean as that one. And it was painted as yellow as a Oregon cheese.



There were the two Ryan boys picking themselves up and feeling of their necks — a driver will most always do that when he's come through a spill — and walking round

WELL, I thought that was a good time to begin my scheme, so I said how fast did Ryan think he could drive the first lap. He said: "A forty-five-mile average is the best any driver living can make on this course. I know every pile of dust the whole length of it. Forty-five miles is the limit—forty-six is the hospital call."

"Oh," I said, "I guess not. If forty-five is the best average we can make, I and Adolph will ship our cars back and go home."

"All right," Ryan said. "Good night! I'm the only driver in the entry list that can make forty-five for the whole race; I'm telling you that straight. No use banging up your car or going into the ditch."

"You could beat that on the first lap," I said, "couldn't you?"

"Sure I could," Steve said. "But I'm driving four laps to win, and I'm not going to take any chances."

Well, now, that was where I wanted him. "You think you're pretty fair, don't you, Mr. Ryan?" I said.

"Yes," he said. "I know I am—on this course. The race is just laid out for my old tub to beat you fellows four ways from the jack."

"Well," I said, "I'll make you a little proposition. Your lady friend thinks you can beat us the first lap. I don't usually bet on my own races, but this time is the once when I break the rule. A good diamond cost a hundred and seventy-five dollars."

"What are you talking about?" Ryan says, but I saw he was getting red.

"That's all right," I said. "Miss Chase told me about the engagement ring. Now, I'll bet you one hundred and seventy-five dollars that I beat you on the first lap. I want to see how much you can go over forty-five, and then I'll know if you can drive or not."

He just snorted and said, you're on, and blew out of the garage. I said to myself, that's pretty soft, because that was the first part of my scheme. So I went to the hotel and got some money out of my money belt, and then I and Henry Winchell, my mechanician, went out to take a spin over the course.

I don't want to hurt anybody's feelings, but all I got to say is, if people in the Imperial Valley want any more races on those roads there, they got to count me out after this. I wouldn't drive that course again with a ox team. Not counting the four bad turns and the sand—I saw sand enough in one half mile to make a respectable beach eighteen miles long and four hundred miles inland—the worst thing in the roads were the ditch crossings. For some reason they've got ditches every quarter mile or so, and they aren't regular scooped-out ones—they're stood up on top of the ground and then dirt piled up to hold them in. The culverts are about four feet up in the air, and the approaches to them are as steep as the sides of a napkin ring. I hit one of them going at forty miles, down in the bushes southeast of Brawley somewhere, after we'd passed a couple towns, and, say, we went through the air on the other side like Glenn Curtis for about one mile. When we lit I thought the engine would drop down and get run over. Henry, my mechanician, is a gritty little fellow, but when I got her straightened out, so I could look at him, his eyes were shut and he was saying: "Now I lay me down to sleep!"

There are five good clear straightaways, though, and I let her out a little and made seventy-six and seventy-eight right along on them, so I said, I guess Mr. Ryan was throwing a scare into me about forty-five mile averages. But when I got back to Brawley we'd been a hour and thirty-eight minutes doing the sixty-one and a fraction of miles, so I was glad I had thought up my scheme. If it hadn't of been for me, Adolph would of been in a hole—a German needs somebody who can think up schemes for him.

I and him both tried the course that afternoon and he did a little better than I had in the morning. I was studying how to hit those ditches, so I was pretty near two hours. Henry said we weren't getting a good mixture, and I stayed up with him and we tuned her 'til she just whispered when she got going. I was glad I had thought of my scheme.

I didn't see anything of Ryan that night, but I heard a couple engines pounding by some time after midnight, and I sized it up that Ryan and some other fool was breezing around for fun. These rube drivers have that sort of idea of fun—that's what they call it. I'd call it a chore myself. Ha, ha!

RYAN showed up and covered my money early in the morning. Adolph and I had only two days for workouts, and we were pretty busy. We ran into Billy Miller and Archie de Garmo that day. Miller had a new car, but De Garmo was driving the same old Persis. They had come overland in their cars from the city and said they had a rotten trip. I was glad Adolph and I came down on the hay and let the mechanicians do the work. Well, there were three more entries—a fellow from San Diego that looked as though he might be all right delivering papers, but he couldn't scare me on the road. The other two were valley drivers. I never heard of them before, but they didn't look like maneaters. Adolph and I sized it up that Ryan was the man we had to beat. I didn't tell Adolph my scheme, which was lucky, because the evening before the race I saw him talking to Ryan for quite a while. If I had of told him the scheme, he might of spilled it to Ryan. You can't tell what these Germans will do—their minds don't move very fast.

I kept kidding Ryan the next morning when we were in the garage about beating him that first lap, and it began to get him. His brother was his mechanician—he was a tall boy, with a red face and blue eyes, and they were both of them regular fellows. It seemed like a shame to do what I was going to, but automobile racing is a business. And I couldn't see anybody in the money but I and Adolph and Ryan and maybe De Garmo.

We drew positions the night before, and it worked out fine for my scheme. The San Diego mail carrier was No. 1, I was No. 2, then De Garmo, then Ryan was No. 4, and Adolph was back in the smoke somewhere. They had a good crowd for a bush-league town and of course everybody jammed out into the street in front of us, and one of the timekeepers found he'd left his stop watch at home on the bureau, and the boys in the pits couldn't get to or from the machines, and there were forty delays, but they gave the San Diego fellow the gun finally, and he went off jumping. I had a minute to wait, so I turned around and yelled at Ryan: "Diamond rings!" and he yelled back: "Watch for me—I'll pass you just north of Holtville!" I looked up into the stand and happened to catch a glimpse of Ryan's little girl—that Miss Chase. I waved to her and then the starter gave me the big noise. I don't like to talk about my driving, but I bet a lot of that gang didn't know I'd started 'til about the time I hit the next town.

My scheme was to make Ryan bust up in the first lap if I could. I had shot him so full of hop about beating him the first lap—and there was the engagement ring, too—that he'd try to catch me. It didn't matter to Old Man Polentz whether I or Adolph won first money, so long as we got it. I figured that Ryan was the only dark horse. He would start two minutes after me and he'd have to be a better driver than I thought he was to get sight of my smoke in the first thirty miles with that lead. It's a mean job any time trying to catch a man you can't see. You never know how far ahead he is, nor how fast he's going. So I guessed I'd have Ryan anxious.

I DON'T want to tell about how good I am, but little Winchell was hanging on with one hand and pumping oil in his sleep before we'd gone half a mile Travel?—say, mister! If the Sunset Limited had got in the way we'd have taken one of those culverts to get on her roof and then gone right over her end for end and set her afire with the friction. Just to show you how I was driving that boat—we ran over a turkey gobbler in the road out in the mushmelon districts, and it was all did so quick he jumped up and started a row with another gobbler because he thought he'd jumped on him. Ha, ha! On the straightaway through what they called the Mesquite Lake we went by a field of longhorn steers—about two thousand of them, I guess—and Henry yelled when I slowed down to take a turn: "Gee, that was a big cow we passed back there!" That'll show you how I can drive when I have to, maybe. But I wouldn't like to brag.

I will say that guy from San Diego surprised me. He probably got to going and forgot how to shut her off. But when we did pass him we were showing eighty-two on the speedometer, and we made him look like he was going backward. My engine was hitting regular as a Salvation Army drum, and I just loved that old Apex. I had to shut her off going through the little town they call Holtville, and I yelled to Henry to look back. "Nobody in sight," he says. So I went through the Main Street at a dog trot, whipped across the railroad tracks, and then jerked her right off the course. Henry made a grab at the dash and I thought he was going to jump. I skidded her against a cantaloupe shed and in behind it, and stopped in the long arcade they have there for the wagons to unload in, or something. Then I killed the engine, and Henry said: "What's wrong, Bob?" and had the hood off before I could tell him.

"Say it's engine trouble, son," I told him. "There's a bunch of rubes coming to see. I'll tell you after a while. Go ahead and tinker with her."

Well, he's a wise kid. He and I put the timer on the bum in about two shakes so it would have taken a expert a hour to find out where the sore place was. The crowd came up and was disappointed to find we weren't hurt, so we shooed them away and just then I heard an engine and here came Ryan.

I hand it to you, boy! You were sure driving a race! He hit the railroad tracks and cleared everything beyond including a creamery and four rows of box cars. When he struck the slow turn along the canal bank there, he didn't even lean over—he just

skidded around. I'm always sorry for a fool driver, but I have to take off my hat to them when I watch 'em work!

I told Henry the scheme, then. It was nothing at all—but I bet a German would have been two years thinking up the first part of it. I hit out before Ryan came along. He thought I was still ahead of him. The farther he went the faster he'd drive to catch me.

And if he didn't smash in the next fifty or sixty miles I was willing to quit and let him have the old Apex. I know about what a man can do—and what he can't, when it comes to driving country-road races.

WELL, Henry thought that was a good scheme—kill Ryan off and make it a cinch for Adolph—but he said, why didn't we let Adolph make pace for Ryan and we win? That's just like a mechanician—they can't see how a German would make a mess of a good scheme! So I didn't tell him anything and we went over to a drug store and had some ice cream. I might have crowded back into the race even then, but De Garmo came right after Ryan, and then the San Diego mail carrier.

This fellow lost a tire at the railroad track and wasted about five minutes changing. And while he was still there Billy Miller went through, but he was having some kind of engine trouble, and then old Adolph, sitting there as calm as a can of buttermilk on the back porch, and his mechanician—Phil Butts—pumping oil and whistling between his teeth—a funny way he had. You couldn't hear him whistle, I mean, but I had drove with him and I knew how he did. One of the valley drivers was out of it and the other was plugging along with his engine sounding like a consumptive sanitarium on a foggy day.

Adolph and De Garmo and Ryan were pretty well bunched for this kind of a event, and I'd lost fifteen minutes, so I let the race go. The ice cream at that drug store was some pazzazas, only the crowd all came in to watch I and Winchell eat it. I don't know what the hicks want to jam around a fellow for when he's leaving them alone. But Winchell likes it, so I didn't say anything. And there was a couple of skirts there—peaches!

Well, in about a hour we heard an engine and went out to see who was coming. Say, I'm glad I thought of my scheme, I says to myself, because it was Ryan, driving like he had to make a train. I figured he hadn't even stopped at the pits—I didn't see how he could with the time he made the lap in—and so he didn't know I was out. He was simply burning up the road to catch me. I bet he thought I must have hit one of those culverts and gone up trying for the altitude record or something. Well, I says, he won't last long at this pace, and I hadn't any more than thought it when—bang he goes!

It was on the flat curve just south of the railroad tracks. He was too far out and he skidded, then the car seemed to jump up in the air and half slew around and then she left the road, went through a fence, turned quarter ways around again and then piled over, end for end. The dust was so bad you couldn't see, but when we got there we found her off the road one hundred feet or so, but standing on her wheels and the engine still running! And what was funnier—there were the two Ryan boys picking themselves up and feeling of their necks—ever notice, a driver will most always do that when he's come through a spill—and walking around. They were kind of stiff—you could see that—but all right. I don't like racing accidents any better than the next fellow and I was glad they come out alive. They must be made of rubber, at that. I don't know how they got through it so lucky.

It was all over quicker than I can tell you, and the two other cars went by—De Garmo and Miller. We gave Ryan's engine the once-over and it was sound as a marriage bell. Some people are made to be hung—the Ryan boys'll never die from a smash-up. We had to herd the rubes off the road to let Adolph by—he came along smoking, picking up about ten miles an hour all the time and his engine running like a watch. It was all right now. The hicks were out of it and the German could beat De Garmo and Miller to a fare-ye-well any time in the last eighty miles of the race. I should worry about him any longer!

Steve Ryan was looking awful blue 'til he saw me. Then he felt better, like a man with a toothache when he sees the dentist getting the pliers. "Where'd you go out?" he says, and didn't he beat me the first lap?

I says he sure did and I guess I about owed him a diamond. "How do you stack up, Steve?" I said.

"Never touched me," he said, "I'm going to drive back to see the finish. Where's your car?"

I told him I skidded off the road and couldn't get on again, and so he and Ed, his brother, went over to their Helen Blazes to see if she'd stand the gaff. They had a twisted frame and a lot of bruises on her, and a tire half chewed up, but the old boat was good enough to go off roaring like a foundry and smoking like a roundhouse. Henry and I had another dish of ice cream and then we cut across country to Brawley.

When I could get into our pit the boys told me how the race was going—nothing to it but Adolph. I was glad I had thought of my scheme. Then Helen Blazes pulled in, about the time that De Garmo and Adolph come through finishing the third lap. That Apex of Adolph's never missed a stroke. She had a awful sweet engine. Well I started over to see Steve and his brother, but that little girl of Steve's—Miss Chase—she saw him first and she made another fuss over him. As I said before, there's no accounting for taste when a woman's tasting. I said: "Steve, you sure drove a pretty race while you lasted."

He said: "I was looking for you. You had me worried."

I kind of grinned, and Miss Chase said: "Don't forget that box of candy."

No, I said, I wouldn't. It was a pleasure to lose to a good man, I said. That swelled Steve all up. I bet he'd shrunk some if I had of told him about my scheme.

WE watched the rest of the race, then. The hick drivers were trying to keep going for third place if anything happened to the leaders, and so they drilled along behind like a procession. When we knew it was about time for the winner to breeze in we helped the constables and other tin stars drive the crowds off the road, but it was a job. You might as well try to shoo women off a bargain counter as to keep a rube mob from getting run over. They seem to always think everybody will get it but themselves.

They had a good crowd for a bush-league town, and of course there were forty delays, but they gave the San Diego fellow the gun finally

Well, I didn't need to guess who'd win—I knew. Adolph rolled up to the pits after he'd made a grandstand finish to show off—trust a German!—and then he stopped and climbed out and took a chew of tobacco. "One thousand bucks, wasn't it?" he said to me. "That ought to keep Old Man Polentz in tires for a week or so. What happened to you?"

"Engine trouble," I said.

He looked at me kind of funny. "What do you mean? You never had anything like that before."

Well, I said, I'd tell him later, and did he know that Ryan had drove his head off and gone over. "Did he turn turtle, do you mean?" he asked me.

But I didn't get a chance to tell him, because just then we heard a car and here comes De Garmo into second money, with his engine on fire, and about five minutes later a valley fellow that hadn't figured in the money at all up to then. Miller had gone out in the last eight or ten miles of the race with a broken driving shaft, or he would probably of beat De Garmo. They said Miller drove a whale of a race when he found I was out. They all felt better when I hit the toboggan, if I do say it myself.

THE crowd was pretty thick standing around Adolph and looking at him and yelling, so I didn't have much to say to him then. But by and by Steve and his girl started our way and then the valley people began yelling for Steve and he had to make a speech and his girl was tickled to death. She came over to I and Adolph and she said:

"Well, I win from you, too, Mr. Stearns. Have you got that three hundred ready?"

Adolph said, you bet he had, and it was fun to lose to as nice a lady as Miss Chase was. Adolph's married, too, but I never knew a fellow that liked to jolly the women along like that German. I believe one woman is enough for a fellow, but Adolph is different, and he kids 'em all. Anyway, I says, what's the bet for, and Miss Chase says: "Don't tell Steve, because it's a surprise for him, but I bet Mr. Stearns that Steve wouldn't go out from his car turning turtle. And there's old Helen Blazes—Steve says she just skidded off the road and never hurt a thing."

That got me kind of rattled, and I had to have it again. "What did you say the bet was about, Adolph?" I said.

"I bet Miss Chase $300 for that furniture for she and Steve that his car'd turn over before he finished," he said. Just then Steve Ryan came up with his brother and Steve honeyed around the girl so I had a chance to whisper to Adolph and I said, what did he do that for, the crazy German, and he said, that was his little scheme to make Steve drive careful.

Well, now wouldn't that get you? When a German thinks up a scheme, isn't it a peach? He'd bet with the girl and she hadn't even told Steve about it, so he hadn't thought about driving slow to win the $300. But Ryan had turned over—I saw him. I was just going to bawl him out to Adolph, and then I had a idea. I went over to the girl and whispered to her: "I'll tell you what I'll do, Miss Chase, I'll add a hundred to that bet of Adolph's and give you the money if you'll make Steve promise to quit racing. Get him to sell that old boat and buy a baby carriage," I said.

"That's a go," she said, and I saw Steve feeling of his neck, that was getting kind of stiff, and I said, she'd better hit him right now with us for witnesses.

Well, Steve was a wise boy. He said he'd already decided he'd never drive another race as long as he lived. "I decided that when the car was up in the air, just beginning to turn—"

Say, it's lucky I can think quick anyway. "That's fine," I yelled, so loud they all thought I must of been crazy, I guess. "Don't say another word. Here's my $175, Steve, for my bet, and four bits for a box of candy for the lady. And here's one hundred on another sporting proposition Miss Chase wins out on."

Adolph says, well, so long as it was all over he'd confess that he made his bet so's Miss Chase would make Steve drive slow, and he was willing to pay up, as long as Steve's car was still on its four legs.

And then I had to laugh. Ryan looked at me and he says, what was I laughing at. So I said: "Nothing, only a little scheme I and Adolph had," and then I said to Adolph: "Come on, little schemer, you'd better cough up."

Do you suppose I was going to let that German get out of paying a fool bet like that? Not much. That's what he had coming for trying to frame up things without letting me in on them.

And anyway I don't believe in gambling on the races your driving in. It puts the razmataz on clean sports, like I told Peggy.

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About 20% of all the dealers in the country, within 60 days of the close of their 1914 experiences, applied for a Studebaker agency and the opportunity to have their names linked with Studebaker reputation. These were BUSINESS MEN, choosing an automobile as an INVESTMENT not as a luxury.

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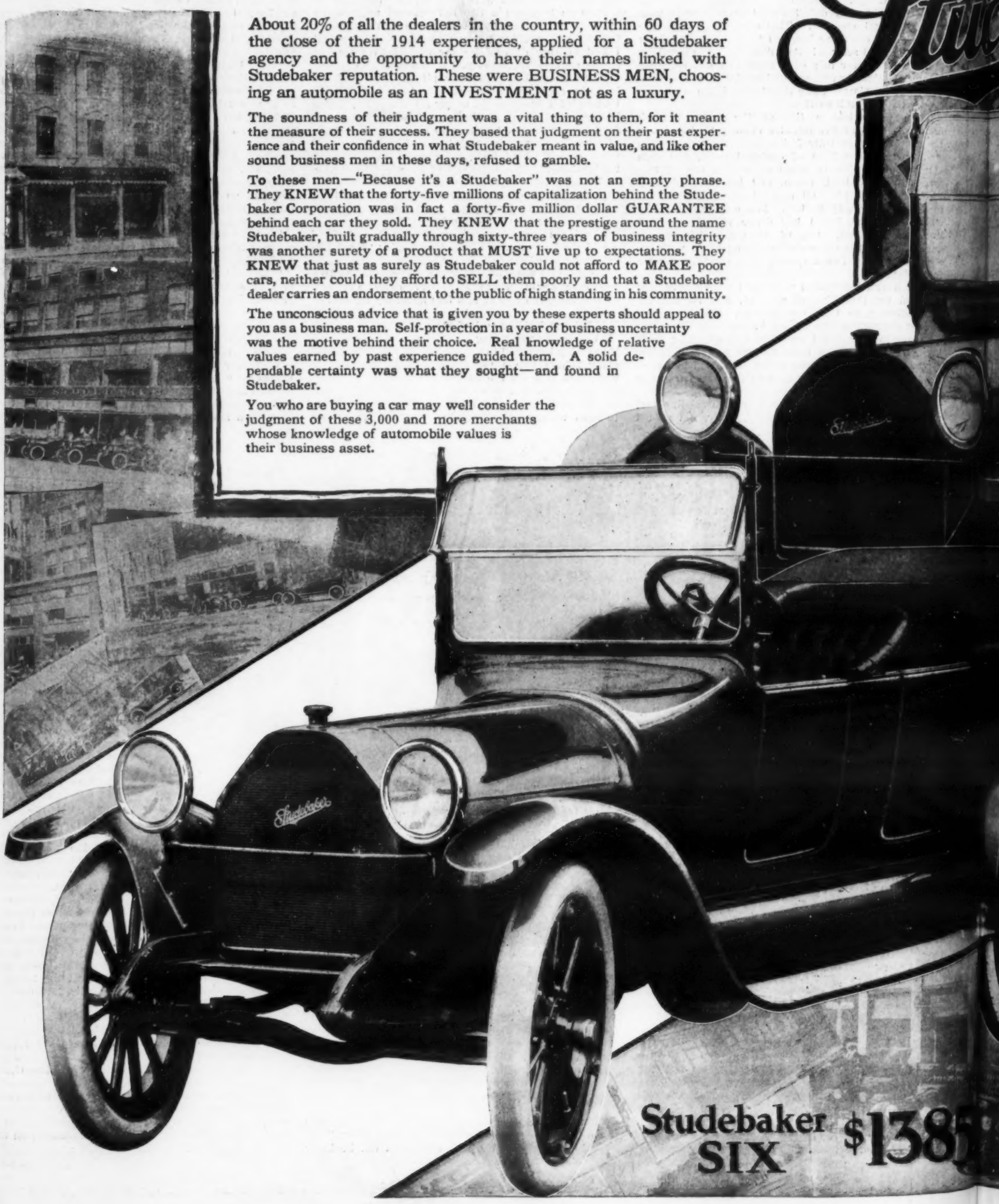
You who are buying a car may well consider the judgment of these 3,000 and more merchants whose knowledge of automobile values is their business asset.



Studebaker SIX $138[illegible]

Specifications

Studebaker SIX

Electric starter, electric lights.
Tires, safety tread on the rear wheels, 34 x 4—Goodrich.
One-man type top, good quality silk mohair. Top boot.
High grade, large size Stewart-Warner magnetic speedometer.
New design locking ignition and lighting switches.
Full floating rear axles.
Complete equipment of Timken bearings.
Windshield made expressly for Studebaker bodies, rain and storm proof—adjustable to rain and clear vision and ventilation.
Extra deep upholstering.
Complete set of high grade tools, pump and jack.
Electric horn, with button set in center of steering wheel.
Magnetic gasoline tank gauge.
Studebaker-Schebler carburetor with dash adjustment.
Quick detachable, demountable rims, with extra rim carried on locking tire carrier at rear of body.
Studebaker stowaway side curtains.

Studebaker FOUR

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High grade, large size Stewart-Warner magnetic speedometer.
New design locking ignition and lighting switches.
Full floating rear axles.
Complete equipment of Timken bearings.
Windshield made expressly for Studebaker bodies, rain and storm proof—adjustable to rain and clear vision and ventilation.
Extra deep upholstering.
Complete set of high grade tools, pump and jack.
Electric horn, with button set in center of steering wheel.
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Extra deep upholstering.
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THE FARMER AND THE MOTOR CAR

BY THEODORE M. R. VON KÉLER

The automobile has raised the value of farm lands, increased the productiveness of the tilled ground and halted the rush of the young folks from the farms to the now familiar city

DURING the past five years a remarkable change has come over the country folk in the more prosperous sections of the United States. Nowhere else in the world is there an agricultural population which is able thoroughly to enjoy the luxuries and advantages of modern civilization to the extent enjoyed by the average American farmer. He may be stubborn and prejudiced at first, but once he decides that certain things are good for him and his family, he throws prejudices overboard and welcomes the "certain things" with open arms. One of these "things" is the motor car.

It was not so long ago that motorists in country districts were subjected to abuses and attacks by the hostile population, who could only see in them an ocular demonstration of the lure of the city, of riches and snobbishness, of unnecessary extravagance and of *dust*. It was chiefly *dust* that started the trouble and *more dust* that kept it up. The slow-moving buckboard was the farmer's "car"—and he resented the intrusion of the snorting, speeding, dust-throwing automobile. "How times do change!"

Now there are thousands and tens of thousands of low, medium, and high priced motor cars owned by the farmers themselves; they have conquered their foolish prejudices and decided to avail themselves of the many advantages of the hated "devil wagons."

The farmer of the hard-working, economical type is not likely to spend $1,000 or more for an automobile, unless it brings him in return a noticeable increase in his income or in some other way adds to the advantages of farming, which in the long run would, so to say, pay for the expense of running it. That there are such advantages admits of no denial; for not only does the automobile on a farm "pay for its own upkeep" in actual money earned, but it has changed worthless farms into well-paying investments whose value is augmented from year to year, as roads improve and motor cars grow more dependable.

It is a statement easily proved by painstaking investigation that the motor car, directly and indirectly, has been the main cause of the recent wonderful development and transformation in the Western and Middle Western States, on ranches and cotton plantations in the South, and in the vast virgin fields of western Canada. It was the automobile, and nothing else, that gave the initial impulse to the world-wide movement for better roads, which movement in this country recently culminated in the setting aside of two "good roads days" by the chief executives of two of the Central States, during which citizens of all classes, from banker to day laborer, worked on the public roads of the State.

To trace the influence of the motor car in the farmer's daily life would be a waste of space and effort. Every person of average intelligence can imagine the advantages which a family living fifteen or thirty miles from a town or city obtains from the use of a motor car. Thirty miles means an hour's spin for a modern car; it means a day's hard work for a team of horses. It is, however, in the wonderful increase of the value of the farm lands along improved roads that the great advantage of the motor car to the farmer is found.

In its propaganda for better roads the automobile has proved the salvation of thousands of farmers who were forced to eke out a precarious existence along impassable roads, where their produce was a "drug on the market" and the exchange of the social amenities with "neighbors" (ten miles away) a dreaded task. More farms have been abandoned by active men and women because of loneliness than is generally believed; the lack of social intercourse has proved a stronger factor in many cases than the sterility of the ground. Productive farms have been left to neglect and ruin because the roads were so poor that a trip to the city, or even to the country store in the nearest small village, was an experience to be classed with the hardest work.

It has been said in this connection that good roads would have come even if there had been no automobiles. Perhaps this is true; but it is equally true that the improvement would have taken centuries instead of decades.

The average human being is loath to assimilate abstract truths, and the average farmer is unable to grasp the connection between horse efficiency and good roads, or horse inefficiency and bad roads. But if the same farmer sits behind the steering wheel of a medium-powered gasoline car, he immediately appreciates the saving in power and in money which the good roads produce. It does not take much of an argument to prove to such a farmer that a horse feels the effect of bad roads on the buckboard just the same as a gasoline motor feels the drag of poor roads on the rubber-shod wheels of the automobile. Once he gets that far in his views on good roads it takes very little to turn him into an enthusiastic supporter of the good-roads propaganda, even to the extent of subscribing a handsome sum for his county's share.

Revolution Wrought by Motor Traffic

THE United States Office of Public Roads, in an endeavor to impress the rural population with the economical advantages of better roads, relates the case of a farmer in Sullivan County, Tennessee, who twice had occasion to haul barbed wire for his farm from Bristol to Kingsport, a distance of twenty-three miles. In 1908 he carried a maximum load of 500 pounds on a wagon drawn by two horses; he required three days to make the round trip. To haul one ton of the wire he needed twelve days, paying $3 a day for man and team, at a total expense of $36. After the road had been improved with the money obtained from automobile license fees, his team could easily draw a ton load and make a round trip in two days at a total cost of $6 per ton.

Another instance reported from Crosby, Tex., is significant. There a shell road was built for one mile out of town. A farmer living four miles from the town came in with a team of two mules and loaded on his wagon at the railroad station two tons of wire fencing. At the end of the improved shell road, on his return, he was compelled to throw off 3,000 pounds of the wire. He then hitched two additional mules to haul 1,000 pounds over the three remaining miles of unimproved road. This man had to make three more trips for the remaining 3,000 pounds of wire, and it required his time from ten o'clock one morning till eleven o'clock the next morning to finish the hauling. If the improved road had extended the full four miles to his farm, the original team of two mules would have brought the two tons of wire to his home in two hours.

In "Farmers' Bulletin No. 505," Paul D. Sargent, acting director of the Office of Public Roads, has this to say of the importance of automobile transportation to the farmer, and particularly to such farmers as rely on sales of garden or farm produce in near-by towns. "In moving products of all kinds from the field to the consumer it is clear that the reduction in transportation charges is most imperative on the country road. During the past ten years remarkable changes in highway transportation have been brought about by the introduction of the motor vehicle. The motor car was first regarded as an expensive luxury, but it has now become an economic necessity.

It is impossible, at the present time, to place an upper limit upon the use of the motor vehicle for any purpose. It is the most potent influence that has reached the road problem since macadam. The adaptability of the automobile and motor truck is almost unlimited, and the farmers, particularly those of the West and Middle West, have been quick to recognize it. In handling milk and cream the motor truck has become especially useful and has extended land areas available for profitable dairying."

In this "extension of the area for profitable farming" lies the crux of the whole motor-car influence. When a team of horses is the only communication available between a farm and the nearest railroad station, the latter must not be more than ten or twelve miles away. Perishable produce cannot be transported over a longer distance by a team and arrive at the railroad station in a condition making it worth while to carry it by train to the larger cities. The value of land, lying more than ten miles from a railroad station, is therefore much less per acre than one lying within an area of ten-miles radius, of which the station is the center. The installation of a motor car, even of the pleasure type, at once doubles and even triples the length of the radius, bringing the former "outcasts" into the "charmed circle" of profitable farming, simply by reducing the time necessary to reach the railroad station, and allowing larger loads to be transported at one trip. Pleasure cars of a convertible type are sold in great numbers to farmers, the passenger body being made removable and a truck body substituted when necessary. The pleasure car itself may be used to carry the family to the station or to the city, while a regular produce wagon is "hitched" onto its rear axle. A loaded motor car will draw another loaded wagon that would stagger the average horse team.

Then there is the question of opportunity in marketing. In this the telephone and the motor car have done wonders for a number of farmers in the cotton belt, and prosperity now reigns where three years ago a bare living was made. Taking an average occurrence during the cotton harvest, or immediately afterward, let it be supposed that two farmers are living at equal distances from the cotton market, one of

How Many Hides Has a Cow?

For shoe soles, one—so thick . . .

For bookbinding and upholstery, four as follows:

A. A thin, top sheet, with natural grain, for bookbinding . . . .

B. A thicker second sheet with natural grain for upholstery of first-class furniture and automobiles . .

C. A still thicker "split" with no natural grain . . . . . .

D. A very thick, pulpy "split" with no natural grain . . . . .

Only the most expensive furniture and automobiles are upholstered with B, which is known in the trade as No. 1 leather. Most "leather" upholstery is done with C and D, coated and embossed to look like B. C and D are known in the trade as "coated splits". They are really artificial leather of a quality inferior to the material sold *as artificial leather* for upholstery of automobiles, furniture and buggies.

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For Automobiles
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Is Guaranteed Superior to Coated Splits

Its base is a specially woven, very strong cotton cloth. The base of coated splits is a thick, pulpy piece of flesh, much weaker than the cloth. Both are coated with practically the same materials. Both are embossed or grained in the same way.

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If you doubt which is better, compare the "split" upholstery of a low-priced automobile with the Fabrikoid upholstery of another, after six months wear.

Several of America's largest makers of automobiles have been upholstering with Du Pont Fabrikoid for two years, with entire satisfaction to the trade and consumers. All makers of low and medium priced cars will soon go to artificial leather. They await public knowledge and consent to discard coated splits for superior Fabrikoid.

Consumers and the trade will best serve their interests by preferring Du Pont Fabrikoid, Motor Quality, over coated splits or other artificial leathers. We were the first to perfect a grade suitable for automobile upholstery, and have at all times since maintained our leadership in this field.

Small Sample Free. Large Sample 18 x 25 inches, 50c.

Please mention Collier's.

DU PONT FABRIKOID COMPANY
WILMINGTON, DELAWARE

Canadian Branch, Toronto, Ontario

whom has a motor truck and the other horses. They learn both at the same time by telephone that cotton has advanced in price $1 per bale. The farmer without an automobile can haul but one bale of cotton with his team of horses over poor roads, while the other farmer, because he has a motor car, can haul ten bales with comparative ease, especially if he hangs a "trailer" to his truck. The rise in price of cotton meant a profit of $1 to the man with the horse team; it meant one of $10 to the farmer who owned a motor vehicle.

In some parts of the State of Maryland farming had reached a period of desultory working about the beginning of the present century, and few new settlers appeared to take the place of those who had emigrated to more western States. The price of farm lands fell to a point where a good-sized estate could be bought for a couple of thousand dollars. About four years ago the Maryland Automobile Club, in conjunction with other automobile associations, began a campaign for better roads in the State. The result of the work, as reflected in the prices obtained for farms situated along the improved stretches of road is shown in the following few figures compiled by Lawrence I. Hughes, Chief of Economics in the Office of Public Roads:

Owner	Acres	Price 1909	Price 1912	Increase
Geo. B. Shay.....	139	$3,500	$6,000	72%
Susan M. Alsop.....	420	6,000	8,250	37%
Tommy Todd.....	110	1,500	2,000	33%
Mrs. Edgar Wallace.	475	5,000	12,500	150%
Thos. J. Price.....	357	2,800	4,400	60%
Wm. Thornburn.....	126	3,000	10,000	333%

In the fall of 1913 motor trucks saved the 1914 crop of 2,000,000 acres of Kansas wheat lands. The long droughts of June, July, and August had rendered the fields too hard for plowing with horsepower. Special trains were chartered, delivering hundreds of motor tractors and trucks to the farmers, when the rain finally broke the long drought, and more than 4,000,000 acres were plowed and tilled by them alone. With 80,000 mules and horses, which is the total number of farm animals available in that State, Kansas could have plowed less than 5,000,000 acres—that is to say, 2,000,000 acres less than her normal quantity. The motor trucks and tractors, however, enabled the farmers to crowd an immense amount of work into a few days and to complete the preparatory work for seeding before the end of October. It is difficult to estimate the exact money value to Kansas farmers that the tractors saved; for on the hard ground the plowing by mules or horses would have been entirely insufficient for the needs of next year's crops.

That the automobile is really the greatest benefactor of the farmer through its insistent demand for better roads is acknowledged by all who have given thought to the matter. That the revenues obtained from automobile licenses can be considered an important asset to the State—one which can be capitalized in advance—is shown by the action which the 1913 Legislature of the State of Maine took early last summer. The new law passed by it provides for an issue of bonds to the amount of $2,000,000 for the purpose of constructing State roads. These roads are to be built entirely by the State and are to be maintained by the State. Maintenance charges levied against those towns in which the roads are maintained shall be the actual cost up to and not exceeding $60 per mile. The interest on the bonds and the retirement fund is to be derived entirely from the automobile revenues. The schedule of charges for registering and licensing of cars and drivers has been determined for several years in advance and will produce a sufficient annual income for the purpose desired. The bonds are to run for forty-one years and bear interest at the rate of 4 per cent. Under this plan not more than $2,000,000 can be outstanding at any one time, and not more than $500,000 can be issued in any one year.

Farmers in districts which have natural beauties to attract motor parties at first resented the intrusion of the automobile. Soon, however, they began to realize a growing demand for fresh farm produce on the part of the hotel owners and summer resorts. Thousands of automobile parties visit such places each season, and their members are accustomed to demand the best obtainable and to pay handsomely for good food. As a result, the neighboring farmers have given up trying to grow "staple" crops and have devoted themselves to the raising of vegetables and berries, which yield a handsome income with a comparatively small outlay in money. The money brought into the summer-resort districts and country hotels by motoring tourists ultimately finds its way to the farmers in that section, while the general increase in business in the country stores acts as a boom in raising the prices of real estate all around. Many of the well-to-do motorists discover on such trips delightful spots on which to erect a country house or in which to spend their entire summer season, and the presence of rich families in the neighborhood of any farm tends to make that farm more valuable—for reasons too intricate to analyze in the scope of this article.

A smooth highway in Illinois. "It is the automobile and nothing else that gave the initial impulse to the world-wide movement for better roads"

The Denver Chamber of Commerce announces that during 1912 more than 25,000 motor parties from other States visited Colorado, spending more than $12,000,000 in the latter State. E. A. Perkins, owner of a country inn on the Valley Pike, near Martinsburg, W. Va., reports that during the summer season an average of ten motor parties stop daily at his place. Much of the money spent by the forty to fifty persons in these cars goes to the surrounding farms for supplying the inn with butter and vegetables.

Wayne County in Michigan, which probably sees more automobiles than any other rural district, has just completed a series of concrete roads which are the envy of the country. They seem to bear up exceedingly well under the heavy motor traffic, and other roads are to be constructed on the same system in other parts of the United States. The value of a well-built concrete road to a farm is almost incalculable.

There are also advantages connected with the automobile in farm life which cannot be measured in terms of dollars and cents. Better schools have been erected in some districts, maintained by a sort of cooperation. Children living far from the new large schools are brought there at public expense in huge motor busses, while a large number of children now are riding to their schoolhouses in their parents' motor cars, particularly in the light, cheap cars so much favored by country folk. The elder brother or the father gets ready for his trip to the city, or for an inspection trip in the little touring car or runabout and bundles the youngsters in the tonneau. They arrive at school quickly and not tired out by miles of walking along bad roads. Many a boy has lost valuable schooling because of the miserable roads and bad weather prevailing in his home county; and girls have been known to lose as much as six weeks on account of impassable roads.

Carrying the scheme of cooperation and consolidation further, there is a marked tendency at the present time in country districts to consider the consolidated school as a social and intellectual center of the neighborhood. The meeting rooms in these large schoolhouses serve as gathering places for public meetings; the school motor busses, and even the old-fashioned "hay wagons," are pressed into service hauling farmers and their wives to grange meetings, lectures, entertainments, and to evening classes in advanced instruction. Such a school must be readily accessible at all seasons of the year, and it is not unusual to see from fifty to a hundred touring cars of all sizes and makes gathered around the schoolhouse on an entertainment evening.

A shady road near Savannah, Ga.: widened and much improved since autoists have speeded over Southern courses

The hitching post, which is still seen in the Western towns, now presents a forlorn appearance on market days, the horse-drawn wagon being far outnumbered by the motor car. Registration figures in the various States show that more than 500,000 automobiles are owned and driven by farmers and villagers—proving conclusively that the modern farmer has not been slow to recognize the value of the motor car on the farm.

Careful observers of economics have noticed during the past five years a decided falling off in the migration to the cities. Motor cars and motorcycles have brought the farmer of to-day into rapid communication with the outside world, and rural free delivery has taken full advantage of the motor as a vehicle propeller. The letter carrier of Kansas and Indiana country districts comes to the farmers' doors astride a motorcycle, or sitting behind the steering wheel of a little runabout, packed high with parcel-post packages.

And to cap it all, there is the increase of activity, gain in bodily health and in optimism, which have been the experience of many farmers. This subject cannot be covered more convincingly than by quoting, literally, the letter of E. C. Edwards, an Illinois farmer, to the editor of his favorite farm paper:

"My wife and daughter had been ailing for years. We had tried all sorts of medicines, 'cures,' and doctors. They cost awfully, but did no good. The whole family became discouraged. It took the spunk all out of me to see the womenfolks dragging through each day in such a forlorn way. None of us were happy, life was hard, work piled up.

"We were going backward in more ways than one, although we stuck close to our work on the farm and in the home and never went anywhere.

"Finally I got desperate and bought an automobile. Never said a word about it until I drove into the yard with the new car.

"My! how my wife did scold me for my extravagance. She'd never ride in it; we couldn't afford it, etc.

"I made no back talk, but after a few days' use of that machine around the farm, carrying milk to the depot, doing twice the business in half the time, my daughter 'felt well enough' to take a ride in it.

"I drove slowly and carefully until she got a little used to it, then I showed her how that car could go!

"When we got home she rushed into the house full of excitement and enthusiasm; hugged and kissed her mother and cried: 'Oh, it's glorious; you simply *must* go out in *our* car!' And with the accent on the 'our'!

"After a few rides my wife liked it as well as my daughter, and since then the whole family has driven out almost every day or evening, if only for a short run. Getting outdoors, breathing fresh air, seeing new scenes and faces, creating new interests along with sharp appetites, has cured both wife and daughter and made a new man out of me! We all feel life is worth living after all; work goes along better in house and field; we are making money and are prospering in every way. Not a dollar has gone for medicines or doctors since I bought my automobile three years ago.

"I understand now what the physician meant who bewailed to a fellow doctor: 'When an automobile comes into the home the doctor goes out!'

"It's true!"

Health, wealth, optimism, and a brighter future—these have been the gift of the automobile to the American farmer.

Copyrighted 1914 by The Republic Rubber Co., Youngstown, Ohio

Old Man Mileage

gives the real facts about tires

"Years and years ago when pneumatics were in their infancy, men began to recognize me, Old Man Mileage, as the SUPREME JUDGE of a tire's value. When they came to me, I told them all—manufacturers, dealers and car owners—that without QUALITY, good mileage is impossible.

"Thousands of tires have I traveled with, from their cradles to their graves, and to those that lacked QUALITY, trouble came rapidly, came surely.

"Think of what a pneumatic tire must do. It must harness a column of compressed air to the rim of the wheel. It must cushion the car against every road shock. It must transmit twenty, forty, sixty horse-power to the road, and hold back tons and tons of speeding steel. It must combat twists and side thrusts that would wreck the mightiest oak. It is constantly besieged from within, from without.

"Surely it takes real QUALITY for a tire to live to a good old mileage under these gruelling conditions.

"To make matters worse, one part, the carcass (or fabric as some call it) must bear most of the burden. It is the Quality of material and workmanship in the carcass that makes the tire responsive and enables it to stand up before the writhing, twisting, pulling of tons and tons. The carcass is the soul as well as the body of the tire.

"Then think of the grinding and grating, the pulling and tearing that the protector of the carcass, the tread, must stand. It takes real rubber and real design to satisfy Old Man Mileage, here.

"And the inner tube, too, now hot, now cold between bending and bouncing fabric on one side and hot compressed air on the other—here is real need for real rubber—real rubber of QUALITY prepared by experts.

"It is a threadbare saying—the best is always the cheapest—but it is true of tires more than anything else I know of. It means as much to the man who sells tires as to the man who buys them. It changes losses to profits, and frowns to smiles.

"The manufacturer, the dealer, and the car owner who look thousands of miles ahead, will some day have thousands of miles of service to look back on.

"QUALITY! QUALITY! I tell you I am a stranger where it does not exist."

REPUBLIC BLACK-LINE RED INNER TUBE

REPUBLIC "WM" TREAD

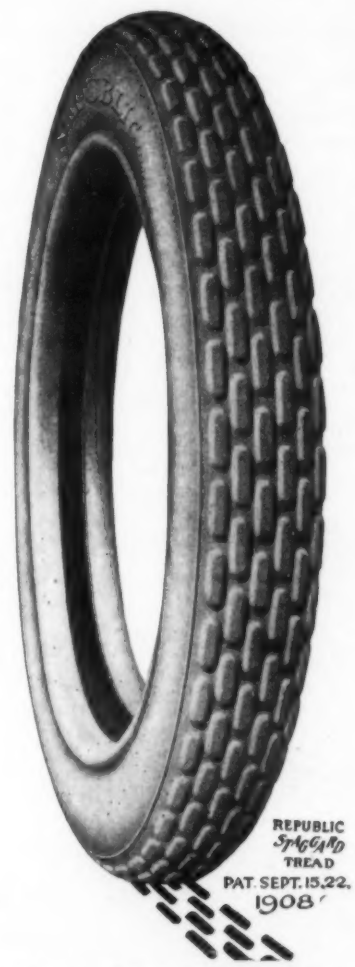
TO EVERY MAN WHO BUYS TIRES:—

Get in touch with Old Man Mileage—he has an interesting proposition to make you. Address

Old Man Mileage

Care of THE REPUBLIC RUBBER CO.,
Youngstown, Ohio

Branches and agencies in the principal cities



OLD MAN MILEAGE SAYS:—

"The original effective non-skid tire, The REPUBLIC STAGGARD TREAD, is the best QUALITY tire I know of. It has a carcass that possesses wonderful responsiveness and stands more punishment than any other. It has a patented tread, imitated by many, equalled by none. Of the inner tubes, the Republic Black-Line Red Inner Tube is Old Man Mileage's favorite. And for light cars, the Republic W M Tread Tire, cannot be equalled."

The traveler sees many markers like this along the Lincoln Way in Illinois

In the Nevada desert, where the route is a mere trail across the wilderness

PROGRESS ON THE LINCOLN HIGHWAY

BY EWING GALLOWAY

THE Lincoln Highway was a 3,400-mile dream—an imaginary line across the map from New York to San Francisco. That was sixteen months ago. To-day it is a great transcontinental thoroughfare—the longest in the world—over which tourists may travel from coast to coast in safety and comfort. It has the direct financial support of good-road enthusiasts in all the States; hundreds of miles of it are receiving special attention from State, county, or municipal highway authorities, and the problem of its beautification has been taken up by three national organizations with an esthetic interest in civic affairs. And in the near future the Lincoln Way will be an ideal hard-surface road all the way from the Hudson River to San Francisco Bay—the pride of the nation, one of the wonders of the twentieth century, and the greatest monument ever dedicated to a national hero.

The success of the plan is largely due to Carl G. Fisher of Indianapolis, originator of the idea, and the other prominent men who constitute the Lincoln Highway Association. They knew exactly what they were about when they put their project before the public. They selected the route with due regard to economy of mileage, attractiveness of scenery, the condition of established ways, the cost of improving bad roads and building new ones, and, most important of all, the number of people to be materially benefited. The Lincoln Way traverses eleven States—New Jersey, Pennsylvania, Ohio, Indiana, Illinois, Iowa, Nebraska, Wyoming, Utah, Nevada, and California—and runs through Jersey City, Newark, Trenton, Philadelphia, Lancaster, Pittsburgh, Canton, Mansfield, Fort Wayne, a suburb of Chicago, Omaha, Cheyenne, Reno, Carson City, Sacramento, Stockton, and Oakland, as well as hundreds of other important places. The route is within easy reach of more cities and towns than it passes through. And the benefits to the farming regions along the line will exceed by far the cost of the road's improvement and maintenance.

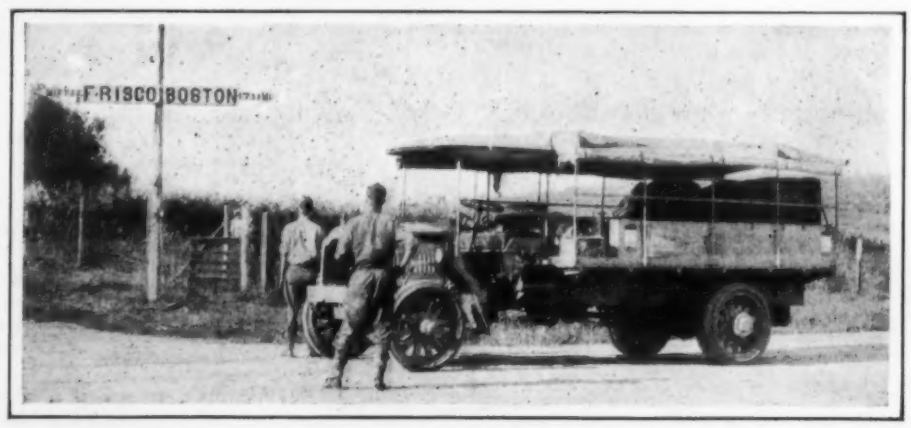
After proclaiming the route, Mr. Fisher and his associates in the Lincoln Highway Association started a publicity campaign, telling the people what the plan meant and appealing for individual contributions. The press of this country and Canada was almost unanimous in its endorsement of the idea, and the promptness with which individuals and business concerns responded to the call for funds was more encouraging than even the ambitious founders of the association expected it to be. In the first year of the organization's existence $153,703.10 in cash, materials, and advertising space was contributed. Of that sum $48,402.76 in cash and most of the advertising space have been used.

Of course the larger part of the work of improving and beautifying the road must be done by the constituted highway authorities of the States, counties, cities, and villages traversed. The rôle of the Lincoln Highway Association is that of an auxiliary.

That the States and local communities can be depended upon to do their share of the work is indicated by what has already been done. The old Newark Plank Road, which runs across New Jersey, has been renamed "Lincoln Highway" for its entire length. It was well improved before the Lincoln Highway Association selected it as a part of the transcontinental route. Chambersburg and Lancaster, Pa., have renamed their streets, while in Ohio forty-two miles, the entire distance across Columbiana County, have been officially redesignated.

The Buckeye State's link is probably the best in the long thoroughfare. Of the 229 miles from boundary to boundary, 145 miles have been hard-surfaced with concrete, brick, or macadam. It is planned to improve the rest of the distance in the next year or two. A little further westward, in Indiana, bond issues aggregating $275,000 have been voted for the improvement of the Lincoln Way. Fort Wayne and South Bend have renamed their streets, as have seventeen towns in Illinois.

A motor truck crossing the continent stops at the base of the Ames monument to the builders of the Union Pacific Railroad



A point in Nebraska, half way between San Francisco and Boston. The man who painted the marker must have thought the Hub was more important than New York, the eastern terminal of the Lincoln Highway

Five counties in Iowa spent $140,000 on the road in 1914, and other counties are expected to fall in line as soon as they have an opportunity to pass upon the appropriation question. Scores of cities and towns in Iowa, Nebraska, and Wyoming, including Cheyenne, have officially renamed the streets which form their parts of the thoroughfare.

Smoothing all of the rough places in the road in Utah and Nevada in time for next summer's rush of automobile tourists to and from the Panama-Pacific Exposition at San Francisco is too big an undertaking for the State and local authorities, and the Lincoln Highway Association itself has decided to take a hand. Considerable funds are required for this work, and the association is making special appeal for contributions.

Appropriate signs have been put up along three-fourths of the route, and the association's officials expect to have the entire distance marked within the next three or four months.

Beauty as Well as Utility

THE marking of the Lincoln Way will hardly be completed when the work of beautifying the route will be commenced. The General Federation of the Women's Clubs, which has a membership of over a million, has voluntarily assumed the task of planting suitable trees, shrubs, and flowers along the road. At the federation's biennial convention last June what is known as the Lincoln Highway Tree Planting Committee was created. This committee, of which Mrs. E. E. Kendall of Chicago is chairman, will be aided directly by clubs everywhere. Permanently improved sections of the line will be the first to receive the attention of the tree planters.

The American Association of Landscape Architects, through its president, Warren H. Manning of Boston, has volunteered to help select and arrange trees, shrubs, and flowers along the route, while the designing of bridges, arches, tablets, and signs will be left to the American Institute of Architects. The latter organization is represented in the work by a committee of three, headed by Elmer C. Jensen of Chicago.

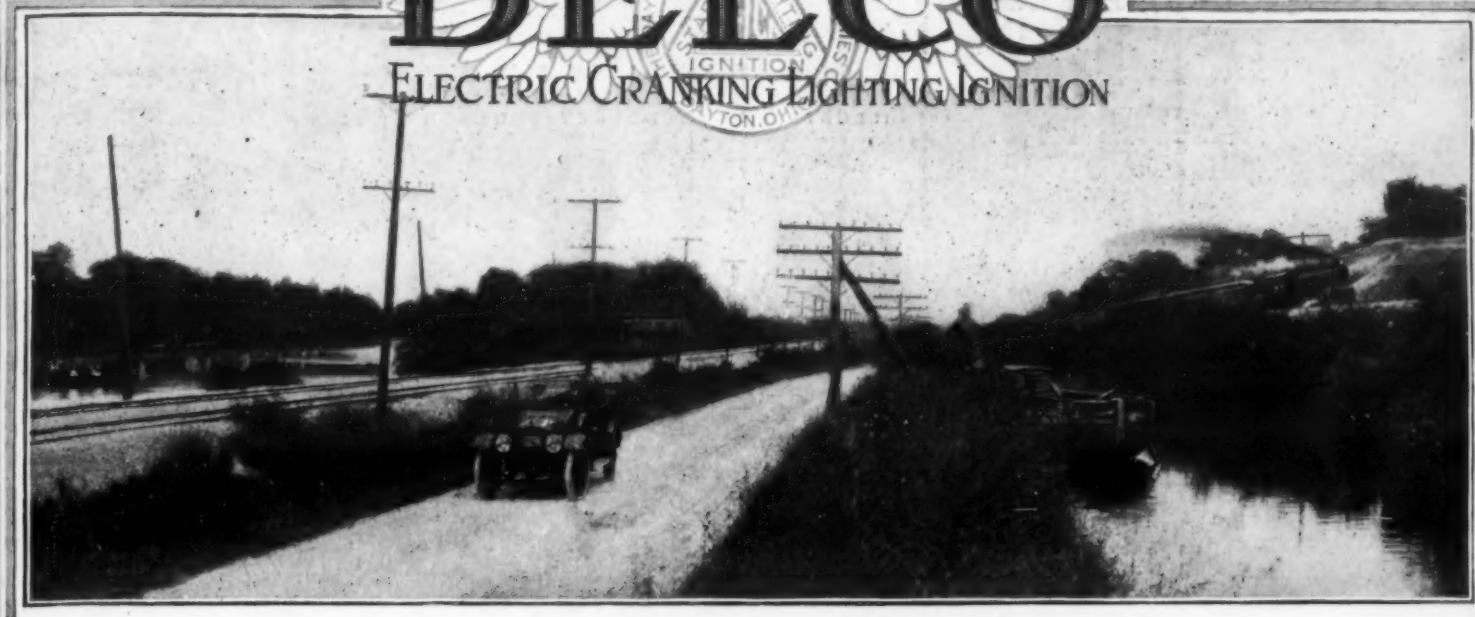
The officers and directors of the Lincoln Highway Association are expecting a large increase in moral and financial support this year, and have made their plans accordingly. They are determined not only to improve the road in the sparsely settled sections in Utah and Nevada in time for summer travel to and from San Francisco, but to achieve big results along the entire route.

The organization is controlled by men who are accustomed to handling large enterprises successfully. Henry B. Joy, president; Carl G. Fisher, and Roy D. Chapin, vice presidents; and F. A. Seiberling, Russell A. Alger, A. Y. Gowen, Paul H. Deming, and John N. Willys of the board of directors are heads of large manufacturing concerns. Emory W. Clark, treasurer, is a prominent Detroit banker, and ex-Senator Albert J. Beveridge, another director, is recognized as a good business man as well as statesman. A. R. Pardington, vice president and secretary, is best known by the public for his work for the Lincoln Highway. He is in charge of the association's headquarters at Detroit.

That these men can be trusted to carry their great work to completion seems to need no better proof than the record of what they already have done.

DELCO

ELECTRIC CRANKING LIGHTING IGNITION



The canoe, the canal boat, the railroad train, the interurban and the Delco equipped automobile—Epoch making steps in the development of transportation—all caught at the same instant by the eye of the camera.

THROUGHOUT the history of the world civilization has hung closely upon the heels of transportation—

First there was the narrow trail through the woods and along the mountain side—the trunk of a tree across the stream—

Mankind walked and beasts of burden carried—

Travel was slow and very circumscribed—

The world lived in a myriad of little communities, each separated from the other by the barrier of distance—

Then came boats—slow, cumbersome affairs—propelled by oar or sail or by mules along the canal routes—The world was brought a little closer together—a very little—

One day a boiling tea kettle suggested to an alert boy the latent power of steam—

The steam engine came—

A new era in transportation and in civilization dawned—

Railroads and steamships multiplied—they connected cities and nations—they developed agricultural and mining and industrial resources—they brought the world close together into one great intimately connected community—

Then came the electric car—the interurban—supplementing and still further developing the civilizing influence of railroad and steamship lines—

And finally came the automobile—crude at first, but quickly developing into a vehicle of almost unlimited speed and power—of universal adaptation and of marvelous grace and beauty.

The most popular of all means of transportation, the automobile has become the center of an enormous industry—it has revolutionized manufacturing and commercial methods—it has wonderfully developed agriculture by bringing the farm and the city close together—it has renewed the interest in the road making—one of the original influences for better civilization—it has largely increased the world's wealth and the world's pleasure—

And yet in spite of all this remarkable development the automobile was, until a very few years ago, sadly hampered by crude methods of starting and lighting—

Then came the Delco System—starting, lighting, ignition—electricity adding the one final touch to the efficiency of the gas driven car—

In a few short months the automobile industry was revolutionized—

The motor car that hitherto had required skill and a strong right arm to operate became as safe and simple and easy to control as an electric carriage—

The scope of its usefulness was greatly broadened—

The safety and pleasure of driving were intensified—

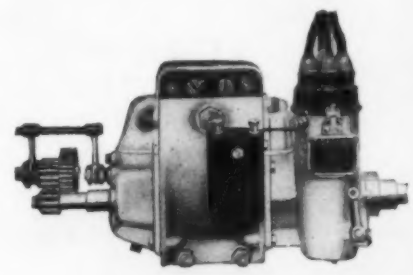
Today 190,000 Delco Equipped cars are in operation—

Thousands of them are being driven easily and safely by women—

You will find the Delco System at the Automobile Shows as regular equipment on the

Cadillac	Hudson	Cole	Cartercar
Buick	Oldsmobile	Moon	Jackson
Oakland	Stevens-Duryea	Auburn	Westcott
	Paterson		

These three units comprise the entire Delco System — cranking, lighting and ignition



The Car That Won't Go Up the Hill

BY MAY MARTS

ILLUSTRATED BY RODNEY THOMSON

1
This is the car that won't go up the hill.
This is the chauffeur, jolly and fat,
Who drives the car, or tries to,
That won't go up the hill.

3
This is the man with the pocketbook
Who bought that car for its splendid look
From the salesman, fair and young,
Smooth of manner and slick of tongue,
Who bosses the chauffeur, jolly and fat,
Who drives the car, or tries to,
That won't go up the hill.

2
This is the salesman, fair and young,
Smooth of manner and slick of tongue,
Who bosses the chauffeur, jolly and fat,
Who drives the car, or tries to,
That won't go up the hill.

4 This is the matron, calm and still,
Quietly waiting to climb the hill,
Gentle manner and pleasant look,
Wife of the man with the pocketbook
Who bought that car from the salesman young,
Smooth of manner and slick of tongue,
Who bosses the chauffeur jolly and fat,
Who drives the car, or tries to,
That won't go up the hill.

5
This is the guest with nerves galore
Who had never been in a car before,
And whose shrieks of terror and wails of woe,
When the car bucked up and refused to go,
Brought a shudder and smiles forsook
The wife of the man with the pocketbook,
While the salesman turned and said quite low
Where he wished that woman with nerves would go.

6
This is the maiden, tall and thin,
Who told the story that brought a grin
To the face of the guest with nerves galore
Who had never been in a car before,
While merry peals of laughter shook
The wife of the man with the pocketbook,
And the chauffeur smiled as he turned the wheel,
As he tried again to climb the hill.

7
So this is the party whose united will
Was to test that car on the tollhouse hill
At the word of the salesman, fair and young,
Smooth of manner and slick of tongue,
Who bosses the chauffeur, jolly and fat,
Who drives the car, or tries to,
That won't go up the hill.

Lower Prices on FEDERAL "Rugged Tread" Casings

Effective December 1st, 1914

A very material price reduction made possible by new and improved methods

The increasing demand during the past two years for "non-skid" automobile casings has lead to radically improved methods of production.

In the Federal plant this progress has been exceptional. Automatic machinery has displaced ordinary equipment, hand labor has been supplanted by mechanical devices, and new methods introduced which have materially reduced our production costs on RUGGED TREAD casings.

Consequently, we are enabled to announce the following schedule of lower prices, effective December 1st, 1914.

Note the Saving on a Few Standard Sizes

Size	Former Price	Reduced Price	☞ Actual Saving
30 x 3	$18.20	$13.80	$4.40
30 x 3½	24.30	18.50	5.80
32 x 3½	25.70	19.70	6.00
31 x 4	31.55	25.70	5.85
33 x 4	33.70	27.55	6.15
34 x 4	34.80	28.50	6.30
34 x 4½	43.10	38.60	4.50
36 x 4½	45.65	40.95	4.70
36 x 5	55.60	47.65	7.95

All other sizes correspondingly reduced.

Nothwithstanding this material reduction, the Quality of Federal RUGGED TREAD casings remain absolutely unchanged.

RUGGED TREAD casings of Straight-Wall and Quick-Detachable Clincher Types have DOUBLE-CABLE-BASE Construction.

Write for complete schedule of prices to our nearest branch, or

FEDERAL RUBBER MANUFACTURING COMPANY
MILWAUKEE, WIS., U. S. A.

Branches, Service Stations and Distributors in all Principal Cites Dealers Everywhere

THE BEGINNINGS OF THE AUTOMOBILE

BY PETER CLARK MACFARLANE

PART I
THE SEERS AND THEIR TROUBLES

THE man who unquestionably designed the first gasoline automobile in all the world broods to-day in embittered silence because the courts have said to him in essence: "Your invention is no invention."

The man who put the first gasoline automobile in motion upon the streets of an American city, whose machine won the first horseless vehicle race in America, and the second; who also won the first race of the kind in England, and in that race defeated the winners of the world-startling French motor Marathon of 1896—this man is still going up and down the country affable, courteous, enthusiastic, interesting—dreaming his plans, planning his achievements, but so far cheated by fickle fortune of the rewards to which his inventive genius and his character as a man would seem to entitle him.

Meanwhile another, a Michigan farmer boy, who, disliking the smell of a horse, had at seventeen years made his first automobile from the wheels and pitman rod of an old mowing machine and a little steam boiler, but who was comparatively late in building his first gasoline car, has made the greatest commercial success in the automobile industry and acquired a fortune beyond the dreams of Cresus.

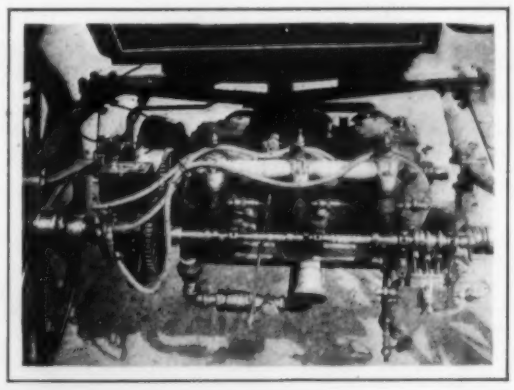
Still another, who took up the manufacture of automobiles less than seven years ago, has a factory enlarging so rapidly that its walls have never stopped building. In them already more than 155,000 cars have been constructed, and this seven-year-old is to-day the second largest manufacturer in the business.

What makes this drama of especial interest now is that the men who began the automobile are still alive and in their prime. They may be talked to, lunched with, ridden beside, and studied. Some of them sit at the head of the great industries which their genius has created. They will take you out and show you in an odd corner of the factory the first car they ever built: a toy-like contrivance of chains and scraps upon which their eyes rest lovingly and over which their hands pass with affectionate pats, as a mother fondles an infant.

His first and only car: George B. Selden in his "Benzine Buggy" of 1905, built from his 1879 model. The engine is shown in the small photograph below

The Pioneers

BUT there are the others—just as real and just as human—who got no prizes, who sit with empty hands as they tell you the story of their inventions and their persistences, of the lure of false hopes, and the final crushing disappointments. These men, too, were pioneers; they, too, endured the jeers and odiums and hardships of the pathfinder, yet their chief reward to-day is in the memory of the thing they tried to do. They have no great factories to show you and their names are not rated in Bradstreet's and Dun's. A million motor cars are humming along the highway, yet scarce one of them all carries their name. In some instances there is a car that bears the pioneer's name, and yet the man himself has no dollar of stock in the concern that makes the car, and reaps no penny of dividends. The sight of his name upon the vehicle or on an advertising placard is to him only a grinning mockery, a bitter reminder of things he would like to forget.



The dream of the horseless carriage is old.

Homer sang of a car that should speed without a horse.

For seven centuries men have been trying to devise such a vehicle. One early attempt was to run by clockwork, but though it made demonstrations before a king, the clock never struck the hour of its practical performance. In Paris to-day may be seen a steam carriage designed by a Frenchman six years before the Declaration of Independence was signed.

In England steam road vehicles early attained what now seems a surprising development. In 1802 Oliver Evans, a Philadelphian, devised a passenger-carrying steam engine and actually drove it a distance of ninety miles over the public roads from Camborne to London, and there placed it on exhibition.

By 1830 steam omnibuses became almost common and were doing a regular interurban traffic in certain parts of England. They were ponderous affairs, whose elaborate appearance astonishes us to-day. However, when their design and operation threatened to become a craze, the provincial-minded, horse-loving Englishman who wanted his turnpikes for his hacks, his hunters and himself rose up in wrath against the hissing, trundling monsters. Enormous tolls were assessed against horseless vehicles; they were forbidden to exceed a speed of four miles an hour, and it was required that *a man on foot, carrying a red flag,* should precede each fire-breathing behemoth. Thus were all self-propelled passenger vehicles effectually banished from the turnpikes of Britain.

In America occasional steam vehicles cropped up all the way along the century. As early as 1835 two different New England men were proposing electricity as motive power for road vehicles, but the problem of successful road locomotion lagged unsolved, so that it is within our own memory that the curtain rises on the beginning of the automobile. The stage for the prologue is quickly set:

Time—The middle seventies.

Place—Rochester, N. Y.

Dramatis persona—George B. Selden, a young attorney.

Scene—A little shop in the basement of his father's house. The young man is discovered at work before a bench with all sorts of odd shapes of pipes and tubes and cylinders upon it. He has a professional, rather than a mechanical, air. He is not clever with his tools, but his lips are pursed obstinately and his black, piercing eyes seem to look the rebellious metals through and through, as if magicianlike he saw the possibilities in the jumbled scraps before him and would compel them to their best.

Selden was an individualist. He went his own way stubbornly. At Yale he made a record for nothing but indifference to all studies save mechanics. Tradition recalls but one good recitation, and that was when an instructor asked Selden a question about electric batteries. George did not know the textbook, but he knew batteries, and broke out in a monologue that was a history of the subject, and so comprehensive and accurate as to win a gasp of wonder from his professor and a round of applause from his fellow students.

When profession-choosing time came, his father, who was an eminent lawyer, elected the legal profession for his son. George elected mechanics for himself. Compromise made him a kind of mechanical lawyer who specialized in patent cases.

Vehicle propulsion had early drawn his attention. In 1869 he applied for a patent on a solid-rubber tire and the means of attaching it to a wheel. This application was never granted, because the applicant had either not the money or the patience to get his papers in proper form. He next devised a form of spring dog to be attached to a wheel for increasing the traction grip on wheels under adverse conditions.

Following this he entered upon the period of painful experimentation which ended with his application for a patent on a road engine. Here the field was uncharted. Selden was the pioneer, and groping, of necessity thumbed his way slowly. He put a pair of spring scales between the singletree and thills of a horse-drawn buggy to determine how much power was needed to propel such a vehicle. He was surprised to find that a pull of only fifteen to thirty pounds would draw a light buggy. That was the first consideration then; the vehicle must be light. Therefore steam would not do for his motive power. Steam engines were too heavy. Selden began to experiment with gas. Gas engines also were too heavy. But Selden thought a light gas engine of high power might be developed.

By 1874 or 1875 he built and operated a combustion engine in which the explosive vapor was supplied by a combination of nitrous oxide or laughing gas and kerosene mixed by an atomizing jet. This engine developed very high power in proportion to weight, but it had one insuperable difficulty: the explosion took place in an external chamber, and the expanding gas had to be introduced into the cylinder proper through a valve. The heat of the explosive gases invariably fused this valve after a short time and killed the engine. To make a gas engine successful for highway locomotion, Selden became convinced that the primary explosion must take place within the cylinder itself. This sort of action characterized what is known as the internal-combustion type of engine.

Blunders and Beginnings

IT WAS also a clearly understood principle that the explosion in a gas engine would be of much greater force if the gas were first very greatly compressed. Therefore Selden's internal-combustion engine must also be of the compression type. One such type was already known, the invention of a German named Otto, styled the four-cycle type, while a New Englander named Brayton was about that very time securing a patent on such an engine of the two-cycle type. Selden chose one of these types and not the other. That choice the court finally held was the rock upon which Selden's invention split.

But at the time neither the Otto nor the Brayton type of engine had been applied to highway locomotion. Selden, groping blindly, was uncertain as to the proper fuel for such an engine when employed upon road vehicles, whether a liquid or a gas, and what liquid or what gas.

An acquaintance of Selden's of that early day holds in memory a picture of the young fellow at work in a corner of his shop with a sheet of iron mounted above a lamp. On the sheet of iron was a ther-

A Motor That is Worth Advertising

Backed by 12 years of undimmed success.

Holding the goodwill of every responsible dealer.

Endorsed by more than 100,000 owners.

Used by 123 manufacturers of cars and trucks.

These facts are the foundations of Continental advertising.

Continental Motors

Any motor backed by these four factors, is a motor worth advertising.

But no motor in the world, save a Continental, has ever achieved this record.

In ten ways Continental motors bring added profit to the owner—added Silence, Power, Speed, Endurance, Economy, Flexibility; more intrinsic Value; greater Security; and the solid assurance of a lasting Organization, with a completer Experinece.

Advertising is a token of faith. And you can always have faith in a Continental motor.

No wonder that one of the commonest expressions of the salesrooms now-a-days is "Continental—of course."

Get this Continental certainty in your next car or truck

CONTINENTAL MOTOR MFG. CO.
DETROIT, MICH.
Largest exclusive motor builders in the world
FACTORIES: Detroit Muskegon

mometer. Bottles of liquid fuel of various kinds stood about, from one and another of which Selden was splashing a few drops upon the heated plate and noting the temperature at which combustion was most readily produced.

At one time and another Selden tried kerosene with the addition of oil of mirbane, of photographer's gun-cotton, picric acid, ether, alcohol, and other liquid hydrocarbons, but finally he came around to the conclusion that some one or other of the petroleum products offered the best mixture.

In the spring of 1877 the Rochester patent lawyer was still worrying about a scheme to compress his gas before exploding it, and his notebooks show drawings of an air pump for this purpose. He was also working out the idea of a gas engine of several cylinders to avoid dead points, a thing, however, which others had done before him. During the spring and summer of 1877 Selden was busy building an internal-combustion engine, using liquid hydrocarbon for fuel and having an air-pump attachment for compression. By autumn he was so satisfied that his idea was workable that he abandoned the rudimentary engine and began the construction of a more ambitious one of three cylinders. These three cylinders he had cast from stove iron, but when it came to finishing them he was short of funds, as usual, and only one cylinder was bored out. This he worked upon to the point of successful operation, and by certain rude tests determined that it developed power enough to propel his projected light vehicle.

Even then several problems remained to be solved of which the inventor was keenly aware. One was the matter of guarding his engine against overheating. This was met by a splash system from a supply of water in the crank chamber. Another was lubrication. In these early days of vegetable and animal oils there was nothing known to Selden which would satisfactorily lubricate the bearings of metal moving at such enormous speeds, but about this time a mineral oil, manufactured from petroleum right in Rochester by a concern for which Selden was himself the attorney, came to his attention and satisfactorily solved that problem.

There still remained the question of the application of his power to his vehicle. The use of the swiftly revolving gas engine made this acute. It is a matter of common observation that the piston on the steam locomotive is geared directly to the driving rod. When the steam is admitted slowly the piston moves slowly and the train may start so softly that the passengers scarcely feel it.

A Game of Battledore

BUT the gasoline engine starts instantly at a speed of hundreds of revolutions per minute.

If the automobile wheels were geared directly to the engine, at the first spark the car would leap from under the occupants at the rate of many miles per hour, and no man who cranked the vehicle would live to tell the tale. Consequently the gasoline engine in the automobile must be totally disconnected from the running gear, and in this disconnected position the engine is started. This had already been worked out in connection with steam road engines and other sorts of machines by means of clutches and transmissions, and the Rochester man, plodding along alone back there in the seventies, evolved a scheme which he felt would meet this requirement in his gasoline engine. When this was done Selden's automobile idea was complete. But it was an idea only. The engine alone was operated. The rest, running gear and wheels, clutch and steering apparatus, was a mere matter of toylike models, of blue prints and written specifications.

Thereafter, instead of proceeding to the building of the gasoline automobile which he had invented, Selden proceeded to the securing of a patent on a road engine which he had not yet constructed and operated. Selden says the reason he did not build was because in that early day he was unable to interest capital in such a crazy thing. This is, no doubt, true; but it is, no doubt, also true that he did not build because he had not the builder's instinct. His bent was theoretical and inventive. Once he satisfied himself that the mechanical difficulties were demonstrably solved, he scarcely looked at the engine again and devoted all his energies to the securing of a patent.

On the 8th of May, 1879, George B. Selden filed with the Patent Office at Washington a model and description of a proposed gasoline road engine, together with a description of his claims. This application was rejected as not being in proper form. Selden amended his application and filed it again. Once more it was rejected. This game of application and rejection was played between Selden and the Patent Office for nearly sixteen years. The inventor-lawyer frequently took advantage of the full two-year limit allowed him by the law before filing his amended application, and it has been intimated that he cannily perceived that his invention was so far in advance of the times that a patent upon it would expire long before the horseless-vehicle industry would reach a stage where it could be profitable to him, the inventor, and that, therefore, he deliberately "stalled," postponing the hour of the obtaining of his patent as long as possible.

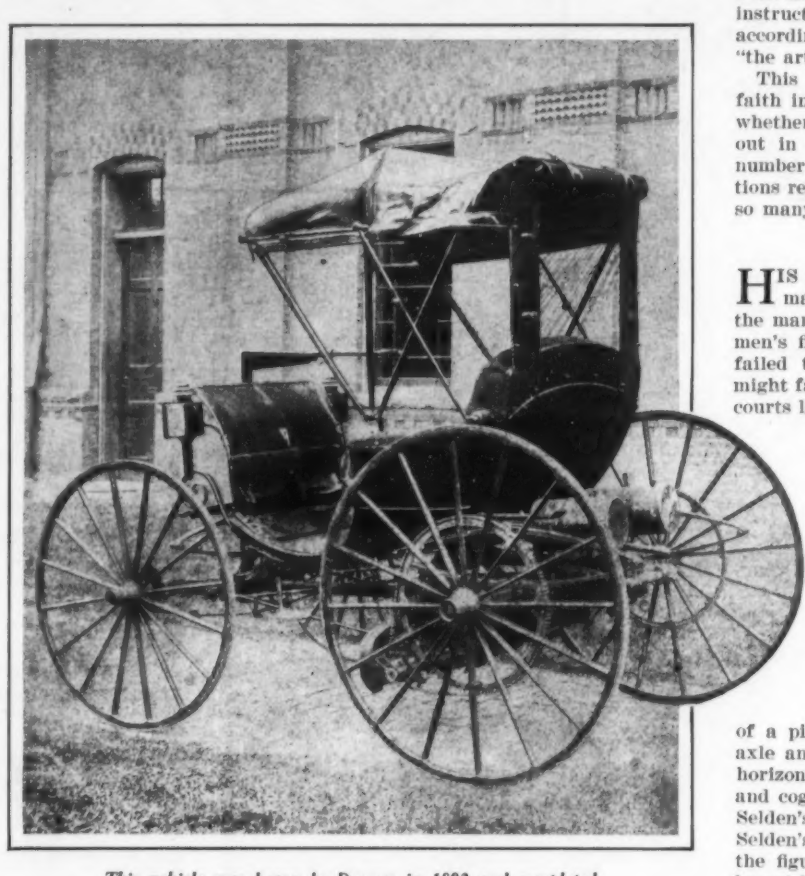
The First Motorcycle

HOWEVER just or unjust this accusation may be, the fact remains that it was only on November 5, 1895, that a patent for a road engine was issued to George B. Selden on his invention of 1879.

To see how far in advance of his time Selden was, we need only start at the year 1879 and stroll forward.

We shall walk for five years before we come upon Gottlieb Daimler, who in 1884 patented a gas road engine in Germany.

The next year, 1885, is the really momentous year abroad. In that twelve months Daimler successfully demonstrated his new motor in a bicycle, thereby making the first motorcycle in all the world. In the same year Carl Benz, also of Germany, built a motor-tricycle, the first of that race of Benz automobiles which have since threaded the highways of Europe and thundered to the front on the speedways of the world, while England was also to the fore with a gasoline-propelled tricycle which was the invention of Edward Butler. It, of course, dared not venture upon the highway at a greater speed than four miles per hour, nor without a man walking before it bearing a red flag; but, all the same, it was a practical self-propelled vehicle of the gas-engine type.



This vehicle was begun by Duryea in 1892 and completed in 1893. It was operated in the streets of Springfield, Mass., that summer—probably America's first practical gasoline-propelled car

On the heels of these pioneers inventive and manufacturing genius began to work rapidly in Europe; but if we return to America we shall have to drag our feet slowly forward for eight more years, fifteen in all, from the day of Selden's application, before we pause at the year 1893 and draw a long white mark, for in that year appeared the first gasoline automobile upon the streets of an American city. This car did not owe its existence to Selden nor to Selden's application for a patent. In fact, while Selden was a pioneer experimenter, he was not a builder, and there is no evidence that what he did was made use of by other inventors.

Progress and Prosecutions

FROM 1893 forward achievement followed achievement with startling rapidity. By 1900 the period of experimental car building in America was practically over. With 1901 the industry was on a commercial footing, and the stirring battle over the Selden patent had begun to rage. The Electric Vehicle Company of Bridgeport, Conn., had the Selden rights and licensed them to whomsoever would upon payment of a royalty. Upon whomsoever refused to pay this royalty the guns of prosecution were trained in suits for infringement. These suits were uniformly successful, and the defeated parties were compelled humbly to pay back royalties and take out their licenses or cease to manufacture. The result was an enveloping movement, by which the automobile manufacturers of America were gradually being enfolded in the arms of the Selden patent.

In the midst of this battle, which lasted for more than ten years, there occurred the most dramatic incident in the history of the war. That was the construction and operation of Selden's first car. This took place in 1905. Automobiles were then on every highway in the civilized world, yet the first automobile of all had not even been built. Twenty-six years had passed. It was still a toy model and a bunch of faded drawings. Litigation was continuous. Selden's model and Selden's plans and Selden's invention were sneered at by the attorneys for the defense. It was intimated that there was a very good reason why Selden had never built a motor car, and that reason was that Selden's car would not "mote," and he knew it. These taunts stung Selden into action. The old three-cylinder motor, crudely cast from stove iron, with its one cylinder bored out and made into the unit of an engine, was still in existence. It had been moved around from one place to another in the city of Rochester; parts of it had been lost and parts of it stolen, but the casting and the principal adjuncts remained intact.

Selden turned this old engine over to a machinist, with his model and original drawings, with instructions to build a practical car exactly according to the specifications, using only "the art and practice of 1879."

This was the acid test of the inventor's faith in his own invention. It would show whether this crotchety lawyer had thought out in his mind and foreseen a sufficient number of the thousand and one complications resulting from the first combination of so many different principles in one vehicle.

A Stove on Wheels

HIS materials had been poor, his workmanship had been crude; the state of the manufacturing art was primary. Other men's first cars, designed much later, had failed to perform convincingly. His car might fail, might declare, of itself, what the courts later affirmed, that his invention was no invention. However, Selden, now past fifty, dared the issue of his lifetime hopes on this model and these plans, worked out while he was still in the twenties, though the chances were strong that it would never turn a wheel.

But one day there appeared, wheezing along the streets of Rochester, what looked like some strange survival of an extinct species. It was a freakish structure, with the look in part of a stout spring wagon and in part of a piece of machinery, for on the front axle and fully exposed to view were three horizontal cylinders and a mass of tubes and cogs and valves. These cylinders were Selden's old stove-iron engine. This was Selden's car. On the end of the seat were the figures 1877, the date when he claims he got his idea fully born.

It is impossible to escape the sense of the dramatic in this situation. The street was alive with charging, snorting gasoline monsters, which passed disdainfully by the queer halting mechanism that picked its painful way along; yet that eccentric limping thing was in one sense the father of all the others, and *the first gasoline automobile in all the world!*

True, it moved only haltingly, but it *moved*. In a way of speaking, it was the first gasoline car that had ever moved, although the movements for the first twenty-five years took place entirely in the brain of the inventor.

Selden's own state of mind toward his finished machine is rather clearly indicated by the fact that he was not even present when the trial run was made.

One day as he sat in the dingy room in the Arcade Building in Rochester, which has been his office for more than thirty years, he received a telephone message from his home, which said: "The machine is up here."

"Well, how in blazes did it get there?" the bearish-tempered patent lawyer asked gruffly.

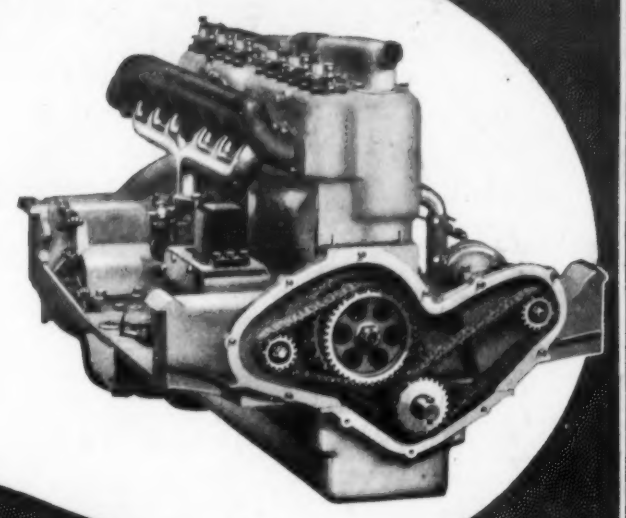
"It ran up here from the shop," was the answer.

Selden hung up the phone.

His machine would run; that had at last been demonstrated. But, then, there was no use getting excited over it; he had known as much for twenty-eight years.

This creation was used as a plaything and enacted the rôle of a public curiosity during runs about the city of Rochester, and in 1906, when one of the many Selden suits was on trial, the car was brought to New York City for a demonstration before the court.

Chandler Light Six Motor is in the Spotlight



Chandler Owners have named it—

"The Marvelous Motor"

See it at the Auto Shows

THE SECRET of the sweeping success of the Chandler Light-Weight Six is the *Chandler Motor.* Up to two years ago men thought that a Six was exclusively a rich man's car. They had the idea that the building of a six-cylinder car entailed *excessive cost.* You could buy a good "four" for fifteen hundred dollars, but to buy a good "Six" took from three to five thousand dollars. Men *took it for granted* that manufacturing problems *necessitated* this difference in price. And then came the Chandler.

The Chandler sounded the turning point in the trend of automobile manufacture. It was a Six—a real Six. It was a light car. And its price was only $1785. Men marveled at this, and wise heads in the industry said "It can't be done."

The Chandler, refined and beautiful, sells now for $1595. Not only that, but now the whole market, practically speaking, for cars selling at more than $1200, is light-six market.

CHANDLER

Light-Weight Six

$1595

Comb this market carefully. Examine every car in it. See how they are built. Study their motors. Drive them, in crowded city traffic and on country highways

Purchasers who make such tests, such comparisons, almost invaribly say, "The Chandler for me."

And why? Primarily, we answer, because of the Chandler Motor.

Its flexible, free-flowing power, its instant responsiveness, its finished workmanship seem impossible in a car of this price.

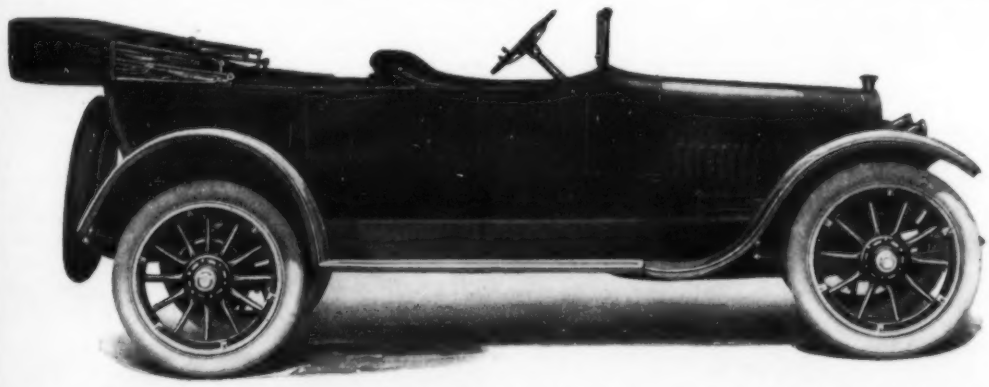
It is truly "The Marvelous Motor," as Chandler owners have named it—not a common stock-design motor built to *sell* to any and every manufacturer who may find it an expedient, but the *exclusive* Chandler design motor built by men of eight years experience in building Sixes, built in the Chandler factory and built to make the Chandler Car *make good.*

Any manufacturer can provide, as we do, roominess of body, beauty of finish, depth of cushions, quality of equipment, in any degree that he thinks you wish to pay for. But *no other* manufacturer can provide for you the Chandler Motor.

It has never been suggested that you should buy a Chandler without looking "under the hood." We *urge* you to look under the hood. We want you to see the Chandler stripped chassis at the Shows this season. We want you to know how *well* the Chandler is built, accepting *nothing* on faith.

We need not urge upon you the beauty of the Chandler body designs. You will see that at a glance. We need not emphasize the wealth of upholstery and finish and equipment. With one look at the car all this is obvious. But keep in mind the *motor.*

With our production nearly trebled for 1915, we hope to be able to supply the Chandler demand this year. The car is sold by a responsible dealer in every principal city and hundred of smaller cities and towns. See *your* dealer now, or write for new 1914 catalog.



Weighs 2985 lbs., completely equipped. Averages 16 miles or more per gallon of gasoline, 700 miles per gallon of oil, 7000 miles per set of tires. Speed 3 to 55 miles per hour on high gear. Climbs every famous "demonstrating hill" in America on high gear. Six body types—Touring Car $1595—Roadster $1595—Cabriolet $1950—Coupe $2200—Sedan $2750—Limousine $2750. Touring model has Golde One-Man Top, covered with Pantasote.

Chandler Motor Features

Cast aluminum motor base extending solidly from frame to frame, giving rigidity to engine mounting and obviating necessity for dirty, rattly, sheet metal drip pan.

Genuine imported Coventry silent chains for driving pump, magneto and cam shafts.

Gray & Davis separate unit electric starting and lighting system.

Bosch Magneto and Bosch Spark Plugs.

Cam shaft and cams cut from solid forging.

Crank shaft unusually rigid and perfectly balanced. No vibration at any speed. Shaft and connecting rod bearings extra large.

Oil reservoir and lower half of crank case solid cast aluminum.

Oiling system completely contained within the motor. No outside piping. Oil pumped from main reservoir into reservoir above all main bearings and thence into every working part. Individual oil trough under each connecting rod. Fly wheel completely enclosed. Instant accessibility to all parts. Cylinders and waterheads finished in pearl gray baked enamel with aluminum and nickel fittings.

CHANDLER MOTOR CAR CO., 1201-1231 131st St., CLEVELAND, O.

New York City Office, 245 W. 55th St. CABLE ADDRESS CHANMOTOR New York Show Space B-23 Chicago Show Space O-2

Do You Ask— Can You Answer These Automobile Questions?

What Are Piston Rings?
Piston Rings are light, flexible, springy metal rings fitted around the piston head.

What Is Their Function?
To prevent the escape of gas between cylinder wall and piston head during compression of the fuel charge; to prevent loss of the power impulse after the gas has been exploded and to keep back surplus lubricating oil.

How Can They Fail?
Whenever they leak. Leakage occurs when they do not fit properly; when their contact with the cylinder wall is not equal or the opening which gives the necessary power of expansion is unsealed.

What Happens When They Do Leak?
Poor compression; excessive carbon deposit within the cylinder, upon the piston head and around the piston ring grooves.

What Is a Little Power More or Less?
Less power means slow starting—failure to take hills or heavy roads properly—continual annoyance—often considerable danger.

Why Do Leaky Piston Rings Cause Power Loss?
Perfect compression is first necessary to get a strong explosion and full power volume. Badly fitting rings with unsealed openings will allow the gas to escape on the compression stroke of the piston. They also cause the loss of some of the power impulse.

Why Do Leaky Piston Rings Increase Carbonization?
Carbonization follows the burning of lubricating oil in the combustion chamber, which can only get up there when the bearing of the piston rings is unequal or through their openings. It is also due to incomplete combustion of the gas charge, the result of imperfect compression.

INSTALL

LEAK-PROOF PISTON RINGS

The Old Way

They Increase Power
Because they give practically perfect compression, being absolutely gas-tight, through the equal, firm and sustained bearing on the cylinder walls which they continuously provide, and the absence of unsealed openings.

They Save Fuel
By putting every ounce of gasoline to work to its utmost capacity and causing the full intensity of each power impulse to be applied to the piston head without any escaping.

They Reduce Carbonization
By effectively holding back surplus lubricating oil and ensuring proper combustion of gas.

LEAK-PROOF Way

They Save Motor Wear
Because they are made to within a one-half thousandth of an inch of gauge, finished with extreme exactness. The special Processed Gray Iron used in their manufacture is softer than the cylinder and takes all the wear—yet will outlast the motor.

To protect you from imitations LEAK-PROOF is stamped on the ring—insist.

LEAK-PROOF PISTON RINGS have been installed in more than 300,000 motors to replace unsatisfactory and inefficient rings originally installed by the manufacturers.

LEAK-PROOF PISTON RINGS are elastic, tough, enduring. Each ring consists of two concentric, interlocking sections with each half so opposed to the other as to seal both expansion openings. This design, together with the angle-iron form of the sections which ensures the greatest strength, is LEAK-PROOF individuality—the patented feature. The rings protect the cylinder—never cut or score it.

LEAK-PROOF PISTON RINGS will pay the cost of their installation out of one year's saving in fuel and oil alone. And not only this, but by checking all leakage of gasoline vapor into the crank case, they prevent the deterioration of lubricating oil and the expensive wear and tear upon the whole engine that results from such a condition.

When your car is overhauled have LEAK-PROOF Rings installed

Send for Free Booklet
It tells all about piston rings and why you should equip your engine with the LEAK-PROOF. How it will pay you in fuel economy and prolonged motor life. Write for it.

Sold by all up-to-date dealers, garages and repair shops

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Pittsburg—7620 Tioga St.
Kansas City—513 New Nelson Bldg.
San Francisco—164 Hansford Bldg.
Los Angeles—224 Central Bldg.
Dallas—1509 Commerce St.

PISTON RINGS
"Ask the User"

Judges, attorneys, and litigants were gathered on the courthouse steps. The inventor himself dropped a handkerchief as the signal for the start. Selden's son was at the throttle of the vehicle. The performance was not an impressive one; but again the car moved. It demonstrated that it would run a little, and probably had run more. Selden's attorneys offered the plausible explanation that any failure in performance was due to the fact that the materials of the antiquated engine were doubtless so poor that it had been completely worn out in the initial trips at Rochester.

Over against this in fairness must be set down the allegation of Selden's critics that this car, with the "art and practice of '79," was put together by a very modern engineer and was, in fact, a mechanical lie. Charles E. Duryea avers that when he saw it the car was equipped with modern spark plugs, and says he understands all the running it ever did was with a modern carburetor.

However, these are features of the controversy that not even a post-mortem could determine.

In any event, Selden won his suit as usual, but litigation continued until in 1909 Judge Hough of the United States Circuit Court appeared to give the final word for Selden when he said:

"If I have correctly apprehended it, there was clearly room for a pioneer patent, and it must now be held that on its face, and in view of the art, *Selden's is such a patent.*"

But there was a group of stubborn battlers who would not surrender, the most prominent probably being Henry Ford, who insisted on carrying his cause up to the United States Circuit Court of Appeals. From this court, a year and a half later, Judge W. C. Noyes rendered the decision which finally and utterly dashed the hopes of Selden by holding his patent valid, but *not infringed* in the modern automobile, the issue turning upon the kind of gas engine described. Selden thought he had covered any "liquid hydrocarbon gas engine of the compression type." But Judge Noyes held there were two such types—that Selden had described one and not the other, and that the type he had not described was the one which had come into general use for automobiles.

How Selden Fared

THE court concluded its decision in a vein that, while philosophic, could hardly have been consoling to Selden. It said:

"He undoubtedly appreciated the possibilities of the motor vehicle at a time when his ideas were regarded as chimerical. Had he been able to see far enough, he might have taken out a patent as far-reaching as the Circuit Court held this one was. But like many another inventor, while he had a conception of the object to be accomplished, he went in the wrong direction. The Brayton engine was the leading engine at the time, and his attention was naturally drawn to its supposed advantages. He chose that type. In the light of events we can see that had he appreciated the superiority of the Otto engine and adapted that type for his combination, his patent would cover the modern automobile. He did not do so. He made the wrong choice, and we cannot, by placing any forced construction upon the patent or by straining the doctrine of equivalents, make another choice for him at the expense of these defendants, who neither legally nor morally owe him anything."

As a matter of fact, the Selden patent at this time had only a year or two to run, and while the decision kept from the patentee the rich sum of royalties claimed from the last litigants, it did not take from him the several millions which had already been paid. Of these royalties actually received an immense sum was expended for costs of litigation; another important block of them went to the other parties in interest; but those who claim to know say that nearly a million dollars actually reached the hands of Selden as his financial reward for a Nebo view of the automobile industry taken in 1879.

To-day Selden's sons are engaged in the manufacture of motor trucks, and some years ago a few passenger cars were turned out; but, aside from these few, at a time when the automobile has chugged its way to the last frontier and forms one of the reddest corpuscles in the blood of civilization, not a passenger automobile in all the world bears the name of Selden except that one old contrivance labeled 1877.

The first American inventor to feel the chug of a gasoline engine beneath his feet on a road vehicle appears to have been Charles E. Duryea, the altogether charming man whose life story is still that of hope deferred. When a boy of twelve or thirteen, flirting with butterflies in clover patches, Charlie Duryea used to lie on his back and look up at the swimming clouds and dream of designing a dirigible balloon. When, in 1882, he graduated from a little seminary at La Harpe, Ill., his thesis was a brilliant disquisition on modes of locomotion other than by rail. In his heart he was already purposing to build a horseless vehicle.

Two or three years later a gas engine at an exposition in Columbus, Ohio, thrust itself upon his attention, and he said to himself: "That is the engine for my horseless vehicle."

Duryea's Dream

HE appears not to have had the slightest doubt that he could build a practicable horseless vehicle, and he was merely waiting until in his judgment the time was ripe for the buying public to consume a factory output.

By 1891 he judged this time had come. Duryea's idea was to build a carriage to sell at about $500 and designed to meet the need of the people who could not afford stable expense, and he never dreamed that he was at work upon something which would be preferred to a horse under equal conditions. Duryea began work upon his initial car with his own hands at Springfield, Mass., in the autumn of 1891. By March, 1892, he had become sufficiently impressed with its possibilities to employ his brother Frank to assist him, and late in the year the car was finished. They tried it and it ran; but it would not run enough. The engine did not develop sufficient power. Like a certain distinguished statesman of our day—it meant well, but it meant well feebly.

There was nothing to do but to do it all over again, using a heavier motor and parts. The two boys worked hard through the winter of '92 and '93, only to be forced to the conclusion that buggy wheels were too light for their heavier motor. Duryea No. 2 was, therefore, reluctantly scrapped before finishing, and No. 3 begun. Wheels of a heavier type were obtained, a stronger frame was used, and the widest buggy body purchasable was mounted upon it. This No. 3, when finished, proved to be operable. It was the first practicable Duryea car and the first practicable gasoline-propelled vehicle built in America, so far as I have been able to ascertain. In appearance it was not the automobile of to-day, but a true horseless vehicle—simply a heavy-built phaeton with an odd-looking wasp's nest suspended between the body and the rear axle. Some one has called this a bustle. I guess that is a better name for it. In this bustle was the motive power.

The wheels were shod with tires of iron, and the vehicle made its first bumpety trip over the streets of Springfield in the summer of 1893.

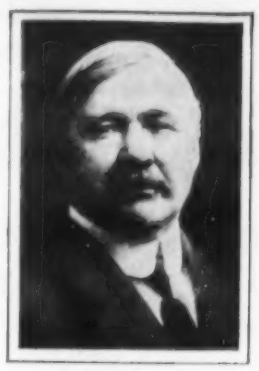
The Triumph

AT that time anyone experimenting with a horseless vehicle was thought to be crazy, and the Duryeas made most of their trials on secluded streets or at night to escape the jibes and scoffs of their neighbors. Later they ventured on extended runs into the country, but preferably at night, and praying earnestly that no defect in the mechanism would leave them stranded on a distant highway and exposed to the jeers of ribald day. The car did so well that Duryea felt justified in entering it at the World's Fair. It was never exhibited, however, because the vehicle itself had opened a whole new world to the Duryea boys, and they were bent on proceeding immediately to commercial manufacture.

No. 4 was started, but scrapped soon after because ideas grew faster than the cars. No. 5 was to be a dream of mechanical perfection. A new engine was designed for it. This engine was to be water cooled, and the circulation of the water was to be guaranteed by a pump. The engine was to have two cylinders, and these were to be cast in a solid block. Yet the whole of this year 1894 was consumed in experiment and a struggle with mechanical difficulties of one kind and another, so that it was not until March, 1895, that the No. 5 car, the second practicable Duryea vehicle, was finally put upon the road. It was equipped with cushion rubber tires. These wore out quickly and were replaced with single-tube pneumatics, which Mr. Duryea thinks was the first application of the pneumatic tire to an automobile anywhere in the world.

Frank B. Stearns

Alexander Winton



Elwood Haynes

Henry Ford

R. E. Olds

Charles E. Duryea

THE GASOLINE PIONEERS

PART II OF
THE BEGINNINGS OF THE AUTOMOBILE

BY PETER CLARK MACFARLANE

IF Charles E. Duryea was the first American inventor to feel the chug of a gasoline motor beneath his feet in a horseless vehicle, investigation develops that there is another "first gasoline automobile," a car of controversy, with a history at once interesting and suggestive. This car was produced in the literary State of Indiana. Its author was a very placid gentleman by the name of Elwood Haynes, who was the graduate of a polytechnic school in Massachusetts. His particular enthusiasm was for practical chemistry.

However, before investing much time in experimentation of any sort, Mr. Haynes took the precaution to make a modest sum of money in the production of natural gas. About the beginning of the '90's these gas interests compelled him to spend many hours in driving from one little Indiana town to another, and if the reader has good imagination, he can see him jogging about in all kinds of weather, sometimes hot and sometimes cold, sometimes wet and sometimes hungry, and almost daily irritated by the reflection that he was wasting an immense amount of time in mere trundling from one place of business to another. The fact that toward the close of day, when he was usually most impatient to reach his destination, his horse was the slowest, set the country gas magnate to thinking. During 1890, 1891, and 1892 Haynes pondered the subject and made inquiries about different kinds of power. His first idea was of an electric vehicle, but when he found the storage battery necessary to produce his horsepower would itself weigh twelve hundred pounds, he turned to gasoline, and in the fall of 1893 employed the Riverside Machine Shop of Kokomo, owned by Elmer and Edgar Apperson, to build a gasoline automobile.

There have been some signs of controversy between Haynes and the Apperson brothers as to the credit for this first car, but when one obtains the story of each at first hand, as the writer has, there appears to be no discrepancy whatever. Mr. Haynes had the idea of a gasoline automobile in his mind, but was not a mechanic, and his ideas as to how to meet the mechanical problems involved were only partially worked out. He employed the Apperson boys, Elmer and Edgar, as mechanics to build his first car, and supplied them with a launch motor gas engine purchased in Grand Rapids, an old buggy body bought from a carriage maker, and a speed transmission of the ordinary lathe-clutch type, also bought for the purpose. The Apperson boys laid out the frame of the car, and under the general instructions of Mr. Haynes combined all these parts with others which they bought or made themselves into an experimental motor vehicle. Mr. Haynes says that during the progress of the work the Appersons gave him valuable suggestions, and the Appersons agree that the project of building the car was his.

Kokomo Stands Agape

WORK upon the vehicle had been begun in October, 1893, just about three months after the first successful run of Duryea's second phaeton.

Exactly twenty years ago, on July 4, 1894, the second practical gasoline car built in America was pushed out upon the streets of Kokomo for its initial trip. A crowd gathered, and, half derisive and half in awe, pressed close about the strange little devil wagon.

Haynes and his mechanics, the Apperson brothers, were not so sure of their contraption that they dared to start its engine in these surroundings. It might fizzle and die, leaving them a laughingstock; or the thing might break from control and go smashing through the crowd at a rate of two or three miles an hour, killing and maiming as it went. A parley was held and a horse was called for.

With equine assistance the vehicle was hauled out into the open country, a distance of several miles from the madding crowds of Kokomo—and there Haynes and the Appersons—equally solicitous but perhaps not equally hopeful—"touched her off"—like some new kind of firecracker.

It is doubtful if any other kind of Fourth of July fireworks in all America that day was quite as significant as this little celebration on the country road in Indiana, when Elwood Haynes signed his Declaration of Independence from the horse.

The little machine buzzed for a moment like a huge bumblebee and then started right off, eating up the miles as methodically as Tom Thumb in a circus parade, and faster than Tom Thumb! Indeed, it is claimed that a speed of seven or eight miles an hour was developed. After running countryward for a mile and a half, the busy little buggy was turned about, and it rumbled slowly but persistently back into the village of Kokomo, a further distance of five miles. Thus was the second successful gasoline car built in America launched upon its career.

Haynes makes the claim that, as a matter of real fact, this was the first gasoline automobile manufactured in America, alleging that Duryea's feat was merely the attaching of a gasoline engine to the body of an ordinary phaeton, while his vehicle was a more homogeneous structure, and was in effect a passenger-carrying locomotive or automobile and not a mere horseless vehicle.

The weight of the first Haynes machine was about 820 pounds. Its one-horse motor was later replaced by a two-horse motor, and it was equipped with pneumatic tires, perhaps even earlier than Mr. Duryea's, heretofore mentioned, but also perhaps not. These improvements enabled the car to attain a speed of twelve to fourteen miles an hour, and it eventually traveled as much as one thousand miles, finally winding up its wanderings in the Smithsonian Institution.

A Dreamer in Detroit

INTO the story at this point now comes weaving the name of another man of the seer type, a rare sort of genius, half artist, half mechanic, and altogether a gentleman, who had a very early theoretical interest in the horseless vehicle and maintained a correspondence with pioneer builders and scientific societies the world over, and whose home in Detroit to-day is an "Old Curiosity Shop" of art objects, relics, and mechanical devices from everywhere. The rooms are so stuffed with them that there seems no place for the people to live. Every art and land and age appears to be represented.

This man was Charles B. King, and in the early nineties he was making his living by the manufacture of marine gas engines. What more natural than that he should thrust one of his marine engines between wheels, and launch the first gasoline automobile that ever snorted through the streets of Detroit! He did this first in the early part of 1894. The runs were only made at night, and so successfully concealed that now Mr. King has some difficulty in establishing the fact that he actually made them.

It was entirely characteristic of the uncommercialized artistic side of the man that after this initial success he did not immediately set about the manufacture of motor vehicles. Instead he dismantled his car, coolly giving some of the parts to his friend, Henry Ford, who was also engaged in the building of a first gasoline car, and himself went on to build another—but with a Duryea engine—which put in the season of 1896 as a part of the menagerie in Robinson's circus. As for King, he went off to Europe to study automobile building, but became so absorbed in art that he put in most of his time painting pictures, some of them exhibited in the Paris salon.

In consequence it was a dozen years before the car which bears the name of King appeared upon the market, and again true, to the dominance of the artistic instinct over the commercial, King found himself soon joggled out of the company which he had organized, and the car of his creation makes to-day no money for the man who made the car.

Chicago Takes a Hand

BUT now, throwing in the reverse and backing up to, say, the beginning of 1895, we have a situation where a good nose might detect the odor of gasoline in almost any quarter.

For nearly ten years stories had been coming from Europe of the performances of Benz and Daimler, Panhard-Levassar and De Dion, and in consequence the horseless vehicle bee was buzzing in a thousand bonnets.

It was a lonely locality, indeed, that did not have somewhere in it a man in a machine shop with greasy hands and puckered brow, tinkering at some sort of plan to defeat the horse. That their neighbors uniformly regarded these men as insane—some mildly, some hopelessly—appears not in the least to have deterred the pioneers in this new field from either their labors or their dreams.

The World's Fair had come and gone with only two horseless vehicles exhibited—a little Daimler quadricycle, weighing 800 or 1,000 pounds, and capable of running four or five miles an hour, and a ponderous electric affair built by Sturges; but in 1894 Frederick Upham Adams, engineer, journalist, and enthusiast, had fired H. H. Kohlsaat of the Chicago "Times-Herald" with the idea that the horseless carriage was an invention destined to influence civilization enormously, and convinced him that to encourage it would not only be good newspaper publicity but good public service as well.

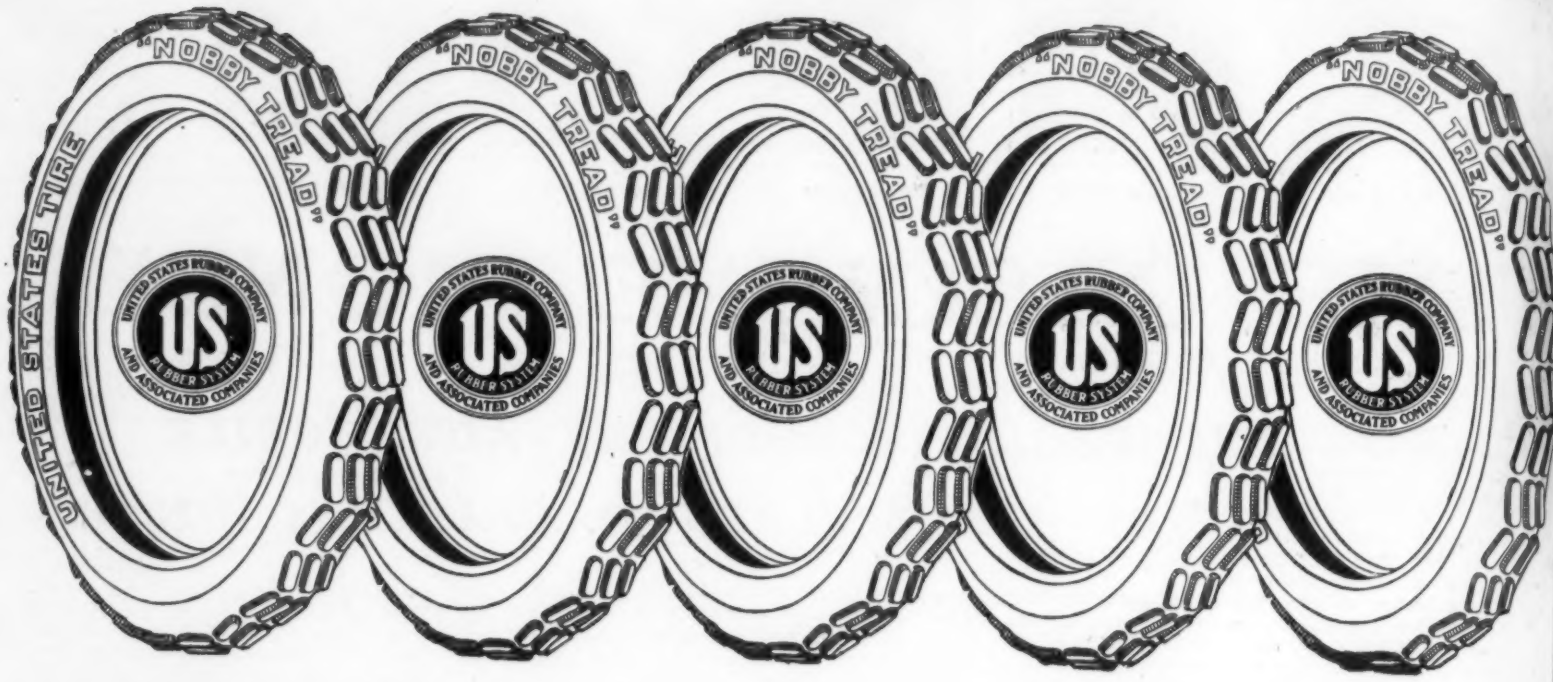
To this end the "Times-Herald" announced a horseless vehicle race to be held in Chicago on July 4, 1895, with prizes aggregating $5,000. This offer greatly stimulated the lonely inventors. It also greatly excited the risibilities of rival newspapers, which set up such a jeering that Kohlsaat undoubtedly wished many times that he was well rid of the project. However, the publicity was managed with exceeding skill.

First, of course, there had to be a name for the vehicle. Horseless carriage would never do. It was too cumbersome and too negative. The same was true of the French word automobile. That would never, never be accepted in America. So a prize of $500 was offered for a name. The titles suggested ranged all the way from petrocar to electrobat; the name which got the cash was *motocycle*.

As for the race itself, there never was a race which had so much trouble. Entries on paper were many, but materializations of cars were few. Several times the contest had to be postponed because there was nobody present to race, and despite the "Times-Herald's" flamboyant shouting, enthusiasm on the part of promoters sagged to the lowest ebb. Finally, on November 2, a number of cars appeared, but still not enough to make the contest more than a farce. Accordingly the race was definitely and finally postponed to Thanksgiving Day, but a consolation contest was held in order to recognize the good faith of the entrants who had actually presented themselves.

The course was a circuit 92 miles in length, over the streets and roads in and about Chicago. But two cars attempted to cover it. One was Duryea's No. 5, his second practical machine which has already been described, and the other was a Benz car, made in Ger-

"Each in a



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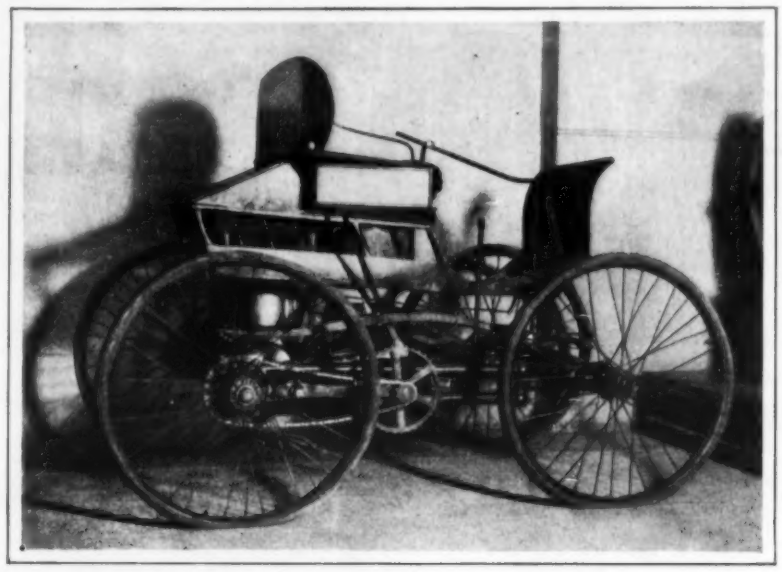
many and imported by a man named Mueller of Decatur, Ill. Its power was supplied by a one-cylinder gasoline engine and it was *driven by a belt*. Duryea's car made a good start, but was delayed by a broken chain. Under way once more, it encountered a team of horses, for whose nerves the appearance of a phaeton propelled by nothing more obvious than a wheezing cough was entirely too much. A mêlée ensued, during which Duryea's car went into a ditch with a broken wheel, while the German vehicle, keeping up its great pace by liberal applications of sand to the driving belt and ice in bucketfuls to the engine, went on and won the race with its consolation prize of $500.

Even the elements conspired against the final race. Thanksgiving Day dawned with snow on the ground to a depth of twelve inches, with drifts much higher. Some of the entrants came to the starting point in drays. Most of them did not bother to come at all. Haynes and Apperson were in Chicago with their first partnership car, but it skidded on the ice and broke a wheel before they reached the starting point. However, they got away with a $150 prize for the best-designed vehicle motor.

Only five cars actually started in the race. Three of them were foreigners, two German Benzes and a Roger from Paris. America was represented by a Sturges electric and a Duryea car, with Frank Duryea at the steering lever.



The second gasoline car that ran on an American highway: Elwood Haynes's automobile of 1894, built for him by the Apperson brothers

The Sweepstakes

NOWADAYS it is not the custom of the spectators to follow an automobile race on foot and exchange persiflage with drivers and mechanicians; but it was found entirely practicable to do these things at the "Times-Herald" race. Nor was anyone run down by the flying, snorting demons. Nobody once shouted: "Car coming!" Occasionally some one remarked: "Stuck again!" Nobody was run over, and the chief casualties were a few backs of onlookers strained by the good-humored assistance lent in lifting the cars out of drifts or pushing them up inclines.

Reporters of rival papers in particular enjoyed the situation as they jogged along in sleighs or cabs and racked their brains for the funniest phrases in which to describe the appearance and discomfitures of the contestants and of their newspaper patron. It is hard to realize that only nineteen years ago the automobile was still a joke to the cleverest people in America.

Only two of the five contestants finished the race—Mueller's Benz and the Duryea car; but the latter was far in the lead.

The winning of this race was a great achievement for America and for Duryea. Two months before, in September of this year, 1895, he and his brother had organized the Duryea Motor Wagon Company at Springfield, Mass.—the first of all that mighty brood of American automobile manufacturers whose great structures and organizations dot the country and span the world—and had begun to send out literature and solicit orders for cars.

After the Chicago victory the Duryeas immediately set about the building of twelve cars like the winner of the "Times-Herald" race.

In the meantime another American editor had become a patron of the new vehicle. This was John Brisben Walker of the "Cosmopolitan Magazine." Mr. Walker offered $3,000 in prizes for a race to be held on Decoration Day, 1896, the course lying from the City Hall in New York to Irvington-on-the-Hudson and return. A number of foreign cars were entered and some Americans. The Duryeas were there with four cars and easily won the race and all the prizes.

This victory left the Duryeas sighing for conquests abroad.

During this summer they went on and completed the manufacture of their first dozen machines and sold three of them. A fourth was sent on tour with Barnum & Bailey's Circus, because it was thought necessary to educate the American public as to the possibilities of the new invention.

Leaving this leaven to work at home, the Duryeas embarked for England, taking with them five cars.

Europe had seen its first automobile road race run in France in June, 1894, on a course from Paris to Rouen; and a year later the now famous Paris-to-Bordeaux race was held with sixty-six entries and prizes of many thousands of dollars—a race which was won by a Panhard-Levassar car doing the entire 744 miles without a break of any kind at an average speed of better than fifteen miles an hour.

This achievement focused a world attention. The practicability of the new means of locomotion could no longer be denied. The automobile was on its way into popular favor. The English Parliament reflected the changing world attitude by abolishing its famous restrictive laws, which limited the speed of a horseless vehicle to four miles per hour and required that a man bearing a red flag should precede each such vehicle. The day this law died, November 14, 1896, was celebrated by the first English automobile race, the course being from London to Brighton, a distance of fifty-two miles. This race was to be a sort of international sweepstakes.

Conquering the Old World

SMALL account, however, appears to have been taken by our English brethren of the possibilities of the American cars, since the victorious drivers in the Paris-Bordeaux contest were given the favored positions at the start of the race, while the two Duryea entries were back in the ruck amid half a hundred other machines of pace so slow that ten miles of the fifty-two had passed before Frank Duryea could thread his car through the crowd and get a chance to race the leaders. Once this became possible, he challenged and overhauled first one and then another, till all were distanced and he reached Brighton nearly an hour's driving time ahead of his nearest competitor.

This was a crowning triumph for Duryea. He had realized the dream of his graduating thesis of fourteen years before. In five years from the time when he laid down the plans for his first car, he had not only built a practical automobile but had demonstrated it to be the fastest automobile in the world.

This, it would appear, was honor and glory enough for one man, and no one will begrudge Charles Duryea one star from that precious crown, since honor and glory seem to be about all that he is destined to get out of the automobile industry. Although a car bearing the name of Duryea is still upon the market, it is the name of his brother Frank, who, after the Duryea Motor Wagon Company passed out of existence, associated himself with the Stevens Arms Company in the manufacture of gasoline automobiles.

A More Than Canny Scot

BUT in the meantime the budding industry in America had gathered another important accretion in the person of one who, although he had made inventions, was neither a seer like Selden nor an enthusiast like Duryea, but a solid methodical builder of machines. This man got his education in the schools of Scotland, but came to America in early manhood. As assistant engineer on an ocean liner, he learned what engines were and what they could do. As a builder of bicycles in Cleveland he gained experience in adapting the principles of ponderous enginery to the light and delicate parts of a small machine. When the achievements abroad and the rumors of experiments at home thrust the horseless carriage upon his attention, this Scotchman, Alexander Winton, set to work to build such a vehicle as methodically as he would have gone about the construction of an ocean steamship.

In 1893 he made a motor bicycle. In 1895 his first gasoline car was finished. It had wire wheels with pneumatic tires of large circumference, and seats for four passengers, two facing forward and two to the rear—dos-à-dos, it is called—so that the vehicle looked like a couple of invalid chairs, fastened back to back, with the sides boxed in.

But the car, though not handsome, would run, and thereby greatly astonished the city of Cleveland, for it was the first gasoline car and perhaps the first automobile seen in Ohio. During the winter of 1896-7 Winton built two more cars on an improved model, one of which was sold. The purchaser, however, repented of his bargain, and the rectitudinous Winton took the car back and worked over the two of them till they would run satisfactorily to himself. Then, to prove that he had built a practicable motor car, with a world-travel radius, he set out on the 28th of June, 1897, to drive from Cleveland to New York City. The difficulties of his trip will be appreciated when it is remembered that roads have improved almost as much as automobiles since 1897.

A crowd gaped about him at each morning's start. Another quickly gathered when he plugged out his engine for the night. On the highway chickens scampered, hogs grunted, dogs barked, and meek-eyed bossies stared astonished, while innumerable farmers pulled their team to one side, where the horses stood

The very latest—in 1896—had more than one modern improvement. The first car manufactured by F. B. Stearns of Cleveland, and still in running order

In 1894 this was the car Charles B. King used to thrill his fellow townsmen of Detroit. The inventor and builder is himself at the steering lever

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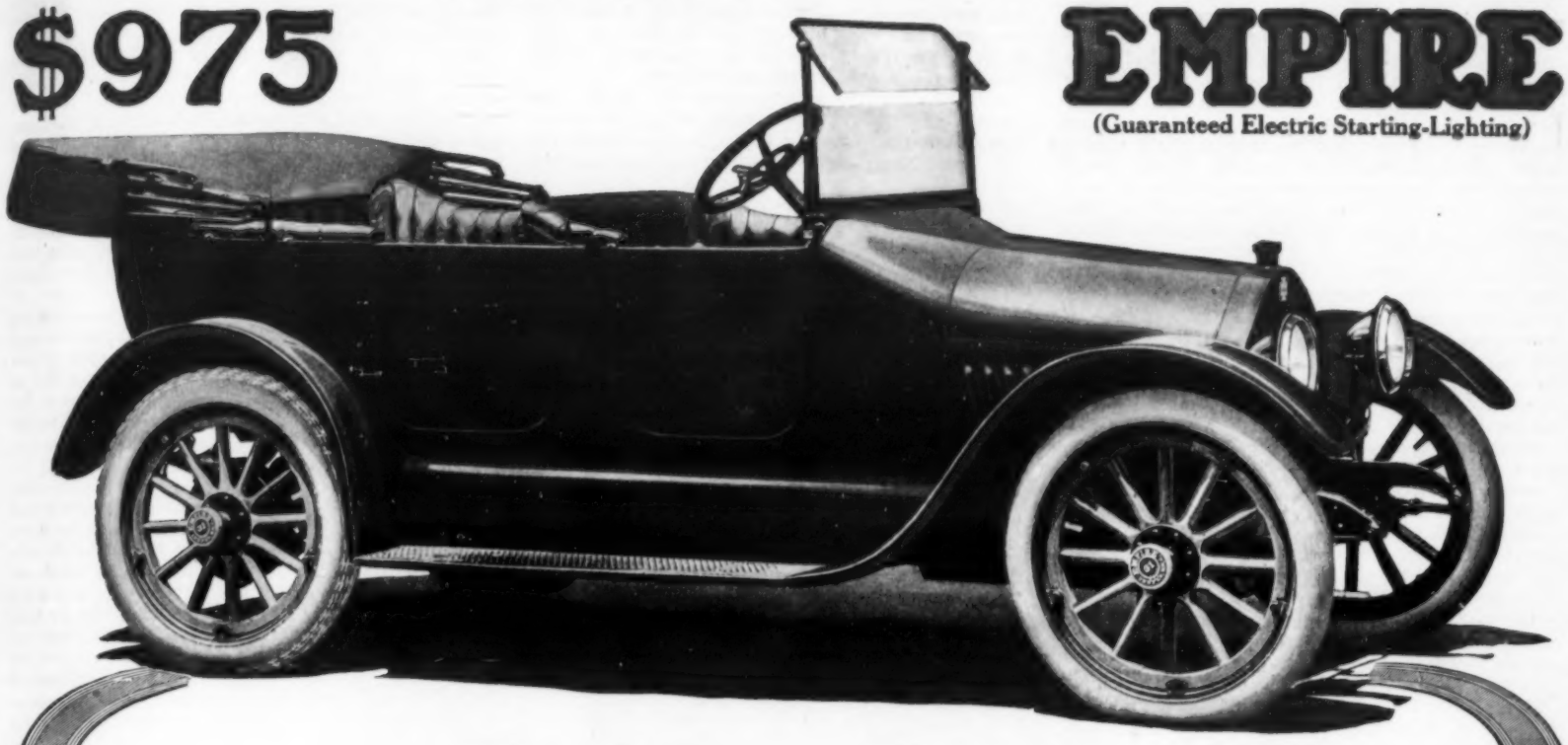

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"Less than one thousand dollars" has been definitely set, by the majority of prospective buyers, as the price they will pay for an automobile this season. It is a decision not made from necessity, but based on good business judgment. Even a year ago, such a decision could not have been made by the man desiring a *SATISFYING* and *COMPLETE* car.

EMPIRE Model 31-40, proves the wisdom of such a decision. At $975.00, this latest EMPIRE provides everything to be desired in a five passenger motor car, and is, in truth, a *SATISFYING* and *COMPLETE* family car.

At first sight, this new EMPIRE appeals to you. The streamline body, characteristically European, is one of exceptional beauty. Every detail is worked out with exacting care. From radiator to roll back, there is not a break in lines. Extra roominess with wide, low seats, and deep cushions upholstered in selected, genuine leather, assures maximum comfort with full carrying capacity.

And appearance is more worthy of consideration this year than ever before. Recent developments in body design characterize the new EMPIRE type as lasting—one that will be in vogue for years to come, because of its grace of lines.

In keeping with the up-to-date design of its body, is the EMPIRE chassis, the most thoroughly tested light car foundation on the market to-day. It gives unfailing service day in and day out, season after season. Proof of this, as well as indisputable evidence of the correctness of EMPIRE design, the quality of EMPIRE material, and the efficiency of EMPIRE workmanship, are found in the fact that the EMPIRE chassis has been continued for five seasons, without change in any basic principle of construction.

The motor is one of abundant power, that will master the worst road conditions. Its efficiency and economy is marked—19 to 21 miles per gallon of gasoline is the average attained by EMPIRE owners.

The EMPIRE is a car without mechanical troubles. One owner writes—"Average driving cost has been less than *one cent* per mile." Another says—"Have driven my EMPIRE 8000 miles without mechanical repairs." All vital parts, all portions that must stand strain are made 30 to 40% *oversize,* to assure surplus reliability and sturdiness.

The equipment is complete to the last detail. It includes everything needful to comfort and convenience—guaranteed electric starting and lighting with extra size storage battery, speedometer, demountable rims, electric horn—and as an increased factor of safety—non-skid tires on rear.

An exceptional warranty is back of each EMPIRE, for EMPIRE cars are fully guaranteed for one year. It is the only car in its class that has such a liberal guarantee covering even electrical equipment. The usual manufacturers' warranty is for but ninety days. EMPIRE owners are protected for a period four times as long as other car owners. This broad guarantee best indicates the EMPIRE company's faith in its product.

Before you make your decision as to the car you will buy, you owe it to yourself to study in detail this new EMPIRE. The EMPIRE dealer in your territory will be pleased to demonstrate. Write for our latest catalogue fully descriptive of this car, the acknowledged aristocrat of its class.

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trembling and the drivers sat transfixed, gazing over their shoulders till the clattering machine, the noise of which had been drowned by distance, looked like a diminutive June bug on the roadway, and even the strange, gassy smell was gone from the air.

Once across New York State, Winton essayed to come down the west side of the Hudson, but found the roads impassable and ferried across at Coxsackie. His progress had been so slow that it was not until August 7, or forty days after his departure from Cleveland, that Broadway discovered a strange-looking buggy, that chugged doggedly down the middle of the street, with an object at the tiller so mud-spattered that it was hardly recognizable as a man, though it was—and a man, we are told, who felt so lonesome, so sensitive under the stab of the curious public eye that he paused for no sort of celebration, but drove his travel-battered machine straight to the railroad yards and arranged for its reshipment to Cleveland.

However, this may have been mainly because Winton, at heart a builder, having demonstrated to his own satisfaction that he now had a practicable model, was eager to enter immediately upon its commercial manufacture. At any rate, he laid down four more cars in his factory during the ensuing winter, and they were completed by the early spring of 1898. All were sold as soon as built, and the first of them shipped to a Mr. Robert Allison of Pennsylvania on April Fool's Day, 1898.

The sales of these four cars, Winton has believed, were the first bona-fide sales of merchantable horseless carriages in this country.

But Charles E. Duryea is positive that the Duryea Motor Wagon Company made the several sales already mentioned during 1896, and Haynes is equally positive that in 1896 or 1897 he and the Appersons sold a phaeton to a Mr. Lewis at or near Poughkeepsie, N. Y., and in 1897 furnished a phaeton to a Dr. Sweeney of Chicago. However, the Haynes-Apperson output in 1898 was only five cars, and by 1897 the Duryea brothers had separated: Charles was starting all over again, and Frank moving slowly and experimentally, so that the manufacture and sale in 1898 of twenty-one machines of the type of Winton's third car may justly be regarded as marking a transition of the gasoline automobile in America from the experimental stage to that of standardization and commercial manufacture.

Henry Ford—*the farmer boy who did not like the smell of a horse—was driving his first gasoline car by 1896*

Olds and Some Others

HOWEVER, at this very time, and right in Winton's own city of Cleveland, was another pioneer in the automobile industry who is clearly entitled to mention here, although he was but a boy of nineteen when his first car was turned out. This was Frank B. Stearns, who, working amateurishly in a shop fitted up in the basement of his father's house, produced a car in the year 1896 that was a marvel of mechanical anticipation in certain features—features which indeed sound like the description of a modern car—left-hand drive, center control, positive control of valves, and positively advanced ignition. In other respects it was just like the groping pioneer machines of the times. It had but one cylinder, mounted horizontally, was chain-driven, and provided seats for but two passengers. In the same year the boy turned out three of these cars, two of which were sold. Of the three, one was burned, one was smashed, and the third survives until the present.

In the following year, 1897, young Stearns came very near anticipating modern practice by half a dozen years at least in the production of a four-cylinder car. He got so far as to make the motor, but his advisers discouraged him so completely and thoroughly that he abandoned it and went back to one-cylinder construction. Though the son of a capitalist, he had great difficulty in financing his mechanical aspirations. His father frowned on a passion for smelly machinery, which so absorbed the boy that he forgot church and Sunday school upon the first day of the week, but the young man plodded along, building and selling and building again, producing seven cars in 1897, six in 1898, and getting under way for real commercial production in 1899, when he produced twenty machines. But now we must shift the spotlight's glare to two other names whose deeds have been waiting for recognition through the whole of this chapter. These men are Henry Ford and R. E. Olds.

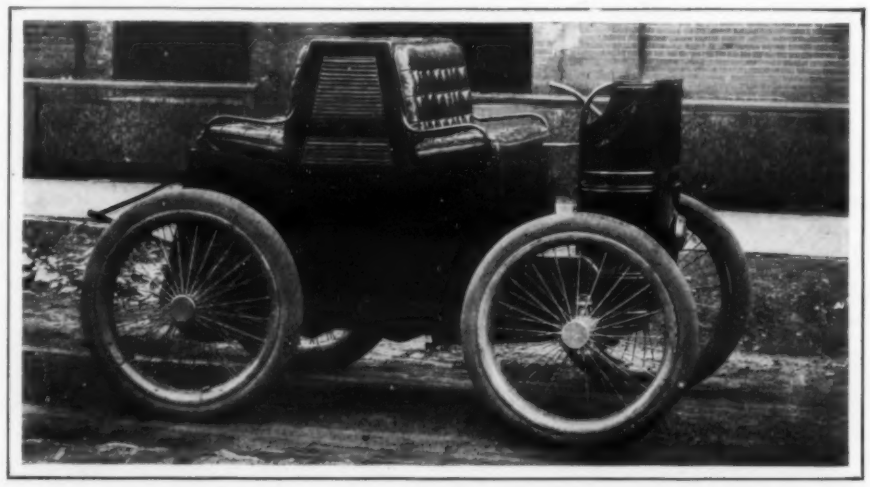
R. E. Olds began life by being born in Ohio, but at eighteen he was going to school in Lansing, Mich. He had a boyish passion for mechanics and put in his spare time building little steam engines in his father's shop, and dreaming out what a lot of fun it would be if he could just stick his little engine under the footboard of the family phaeton and run about on the Michigan roads, independent of the horse.

By 1887 Olds had actually done this thing. His phaeton boasted but three wheels, and got its power from a little upright steam boiler, mounted under the footboard. The power was transmitted by sprocket chains and gasoline was used for fuel.

This freakish vehicle was for three or four years at once the bane and the jest of the streets and country roads about Lansing. But somewhere in the period between 1891 and 1893 Olds appeared with an improved type. The new carriage had four wheels, instead of three, and was of a more distinct phaeton type with canopy top. It also used steam for power and gasoline for fuel, had an upright boiler, mounted on the forward axle, and proved its kinship to the crab family by appearing to go backward—that is, it steered from the rear, the hind wheels, instead of the front ones, being pivoted. Young Olds could carry water enough to run him ten miles and fuel enough for twenty, so that this car got farther into the country than the other one had, frightened more horses and earned the young inventor more enmity than the first. But it also got him more fame. Visitors came from a long distance to see this second car perform, and it was finally purchased by a patent-medicine company, operating in India, for $400, and ordered shipped to that far-off country. This sale was possibly the first commercial sale of a horseless vehicle in America.

Now since 1890 the business of Olds had been gas engines, and it is rather strange that it was not until 1894 that he made up his mind that the gas engine was the one best adapted for vehicle propulsion. He began work upon a gasoline car in that year and designed it for entry in the "Times-Herald" race of 1895, but did not get it ready in time.

This machine appeared to be sufficiently successful in operation to warrant the organization of a company for its manufacture, and in 1896 the Olds Motor Vehicle Works was formed, the second corporation in America to be organized for automobile manufacture. The Olds Motor Vehicle Works lived but three years and built but one car, an ambitious two-cylinder machine—with an *electric starter!*



Winton's experiment: *built in 1896 at Cleveland. This is Alexander Winton's first car—propelled by a two-cylinder vertical engine, bevel-gear transmission. Axles and wheels are mounted on ball bearings, and the wheels are of wire, with wood rims and pneumatic tires*

Henry Ford was the farmer boy mentioned in an earlier chapter who did not like the smell of a horse. He made his first automobile out of the parts of an old mowing machine and a little steam engine. This was done on his father's farm, eight miles from Detroit, in 1879-80, at the very time when Selden was beginning the fight for his patent.

In 1890 Ford was working for the Detroit Engine Works as a machinist. He left this to become night engineer for the city electric light plant, and was successively chief mechanical engineer and chief engineer of that concern; but never for a moment did he abandon the plan of his youth to get and keep the smell of the horse out of his nostrils. Yet he did not purpose to walk all his days, nor to fly or swim. He still stuck to steam in his attempts at highway locomotion, and the years 1892-3 saw him plugging about the streets of Detroit in a steam buggy of the brougham type.

In the year 1894, however, he swung to gasoline as a preferred motive power; but Ford was a slow builder in those days, and felt his way with his own fingers over every detail of this machine, so that when, late in 1896, he put his first gasoline car upon the streets, every detail of it except for the larger units and two or three little valves given him by Charlie King was not only that of his own hands, but the product of his spare time after he had given the best of himself and of his day to the services of his employers.

This first car of Ford's was a two-cylinder affair, and depended upon a wipe spark for ignition. It had four wire wheels with large pneumatic tires, sat very low to the ground, and was supposed to be of the runabout type. Its diminutive size is more suggestive of the crawl-about, and Mr. Ford's neighbors testify that there were many times when it refused even to crawl, which function would thereupon devolve upon the inventor. They will tell you that Henry Ford, flat upon his back beneath this Lilliputian car, with oil and hot water leaking into his face and trickling along his ribs, measured his length from end to end of the roads about Detroit during the time when this first vehicle was at once the mainspring of all his hopes and the source of most of his troubles.

Tell Ford this to-day, and from either side of his long, keen nose first one gray-blue eye and then the other will twinkle merrily, while he remarks that real troubles were a-plenty in those days and there is no need whatever to exaggerate them now in retrospect.

Facts About Ford

BY 1898 Ford had his No. 2 gasoline car finished. It was also a two-cylinder car of the runabout type, with two speeds forward and reverse. Like every car built by Ford, it was strongly individualistic in type, and naturally was only an experimental car. Nevertheless, it seemed so far advanced in performance that a company was organized for its manufacture, called the Detroit Automobile Company.

This concern was capitalized at $60,000, but only about $10,000 was ever paid in, and the whole of this was consumed in experiments looking toward a satisfactory model. It was during this period that Henry B. Joy, son of wealth and aristocracy, who later recreated the Packard car, had his first touch of horseless-carriage fever. He went to the Detroit Automobile Company where Ford was turning out his cars one at a time and contracted to buy the vehicle then under construction. The two Henrys—Henry Ford and Henry Joy—went upstairs in the shop to look at it.

"Don't buy it," said Henry Ford after the inspection. "Take the next one; it will be better."

That was Henry Ford in those days. His fingers had not caught up with his ideas yet. He still believed he could surpass himself. His concern manufactured 180,000 cars in 1913 and declared a dividend of many millions of dollars; yet he hasn't changed the model noticeably in six years. He knew what he wanted then, a practical, economical car—a plain car for plain people—and he worked till he got it. Once he had it he stopped experimenting and turned his entire genius to manufacturing, and it may be doubted if any man ever worked out an idea more clearly or stuck to it more effectively than Henry Ford.

But Joy did not get that next car of Ford's because there wasn't any next. The finishing of the one the two Henrys were looking at in the upper story of the little factory took the last of the $10,000. The Detroit Automobile Company, modest forerunner of the greatest motor-manufacturing concern in the world, was done. It blew up like a tire.

But Henry Ford was not done.

He continued his experiments after the failure of the Detroit Automobile Company in a corporation called the Henry Ford Company. Soon he scrapped the "company" and was just plain Henry Ford, at work again in a barn with a streak of smut on his face and a great idea sizzling in his brain.

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AGENCIES EVERYWHERE

ARGONAUTS OF FORTUNE

PART III OF THE BEGINNINGS OF THE AUTOMOBILE

BY PETER CLARK MACFARLANE

BY THE beginning of the new century the automobile had demonstrated wonderful possibilities and was no longer a curiosity. Wealth and leisure had increased enormously, and every year American tourists, returning from abroad with tales of the delights of automobiling on Europe's wonderful highways increased popular interest in the new vehicle and created a buying public. The first manufacturers to throw their great plants open to the automobile were the bicycle men. Because his name, once a commonplace of any motor meet, has now disappeared from the industry, I choose a part of the story of E. R. Thomas.

Thomas was not a mechanic, but a selling genius. Commencing life as a railroad man, some turn of the wheel made him manager and part owner of a branch bicycle factory in Canada, where he was very successful.

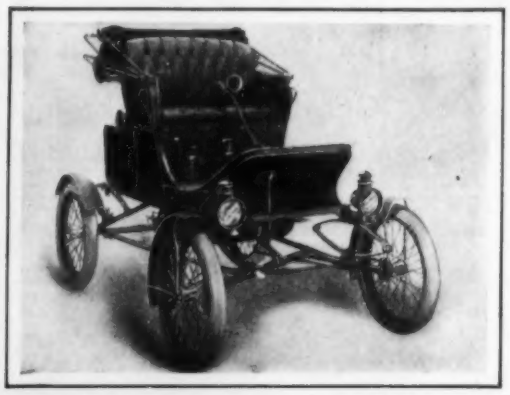
Thomas got his first motor ride at Paris in 1897. The vehicle was a Panhard, three-wheeled, cumbersome, and slow; yet to the bicycle builder it seemed to fly. In his enthusiasm Thomas bought one, took it back to Toronto, and told his bicycle engineers to duplicate the machine in every particular. But where were they to get the parts?

Thomas persisted with his idea, and by 1899 he sold out his bicycle business and came to Buffalo with the avowed intention of manufacturing automobiles. Instead he turned to motorcycles. Thomas had faith enough in the gasoline engine, but his salesman's instinct warned him that the public was not yet ready to absorb a gasoline automobile. So he put his automobile engines upon bicycle frames.

Hugh Chalmers of Detroit

When, in 1900, Thomas's motor-car building actually began, the greatest trouble was still in getting parts manufactured. The sixty-fifth motor in one hundred which his engineer bored out was the first found without a flaw. Nothwithstanding these difficulties, one hundred one-cylinder cars were put upon the market in Buffalo in 1901. These proved great speed burners for that day, and shot about over hill and dale at twenty-five miles an hour. As the diminutive vehicles went spitting along the country roads, some one nicknamed them "black cats." Their success fixed the place of Thomas in the early years of successful automobile manufacture. In this very year, 1901, and in the same city of Buffalo, the George N. Pierce Company, builders of Pierce bicycles, broke in with the first of the great line of Pierce Arrows, while in 1902 the Popes, makers of Columbia bicycles, turned out the first of the Pope-Hartford cars.

Farther west the bicycle men got started even earlier. Gormully & Jeffery of Chicago produced a motor bicycle as early as 1897, and late in 1898 had the same idea on four wheels. This was the first Rambler—now the Jeffery. However, it was not until late in 1901 that Jeffery began the manufacture of automobiles on a commercial scale in Kenosha. But while the bicycle men were getting started, one of the pioneers of gasoline and a man who had been also a pioneer of steam, was making a commercial success in automobile manufacture. This man was R. E. Olds. By late 1900 Olds had evolved a one-cylinder runabout,



The first of the White steam cars (1901)

The first Stanley steamer, with the Stanley brothers on top. This photograph was taken in the spring of 1897

the most conspicuous external feature of which was a curved dash. Olds found his modest vehicle famous over night.

The demand for them was amazing. They even went abroad, and Sir Thomas Lipton had himself photographed sitting proudly in one of these cars before his London home. Four hundred and eighteen of these cars were made and sold the first year. This was many times more cars than anybody else had ever made or sold in a single year. Yet Olds proposed to make just ten times as many the next year.

By 1903 the thrifty Michigan folk had time to do a little figuring, and they concluded that Olds was not so crazy after all. The capitalization of his reorganized concern had been $350,000. By stock dividends this was increased to $2,000,000, and, after declaring a dividend of 75 per cent, a cash surplus of $600,000 still remained on hand.

If this was insanity, let there be more of it, prayed the Michiganders. In this same city of Detroit were four business men, named, respectively, Murphy, White, Black, and Bowen, who some time earlier had been bitten by the automobile bug in the hands of Henry Ford. Also, in the city of Detroit, was a manufacturing concern famous for the excellence of its machine work and known as the Leland & Faulconer Company. In this concern was a young engineer, Brush by name, who had a design for what he thought was a practical motor car. The three interests got together and production began. The new car was named the Cadillac, which is a good old romantic name down Michigan way. The new vehicle scored almost instantly and became the first of that line of Cadillacs which, in 1909, passed under the control of the General Motors Consolidation for a cash consideration of $4,500,000.

This gave the city of Detroit the two most successful automobile factories in America, from the money-making standpoint, and now a third hat was about to be cast into the ring.

This hat was slightly battered by previous castings, and it belonged to Henry Ford. Henry had been tinkering with automobiles for twenty years. He and a coal dealer named Malcolmson, pooling fortunes—and misfortunes—had each put several thousand dollars in money into the making of a car which looked a good deal like Brush's one-cylinder Cadillac. In June of 1902 they organized the Ford Motor Company to manufacture this car, Ford and Malcolmson dividing 51 per cent of the stock equally between them. The other subscribers paid $28,000 in real money for their 49 per cent, and this was all the cash ever supplied to the Ford Company as it stands to-day.

In 1903 Ford made and sold 672 of his Model E cars. This was the second year Olds had made 4,000 cars, the year which saw another triumph for the Cadillac, and it was also the foundation year of Ford's colossal success, because the man—just turned forty—had now a tight hold of "the Ford Idea": "*Make one thing and make nothing else, and you can make that one thing better and cheaper than any other manufacturer in the world.*"

Probably the ups and downs of this volatile industry are nowhere more clearly illustrated than by the experience of the coal dealer, Malcolmson, who became the partner of Ford's hopes—and liabilities—after the Detroit Automobile Company collapsed, and in recognition of this received an equal share with Ford of the stock of the Ford Motor Company.

Somewhere about 1900 Malcolmson had discovered in the railroad yards of Detroit a car checker known familiarly as Jim Couzens, who appeared sufficiently bright for the merchant to take him away from the railroad and set him to looking after the traffic end of his coal business. Couzens proved wondrously apt at this. Soon, as Malcolmson's Man Friday, he began to look after his employer's interests in Ford's concern, and presently had the same complete grasp of its affairs.

John North Willys of Toledo

Michigan, Motor Maker

BY 1904, however, the coal dealer had concluded there was no great future for the Ford Company and sold his stock. With the stock, as if to sweeten the bargain, he allowed the astute Couzens to pass. That was the beginning of a meteoric flight for James Couzens. To-day he is the right hand of Henry Ford and one of the kings of the motor world.

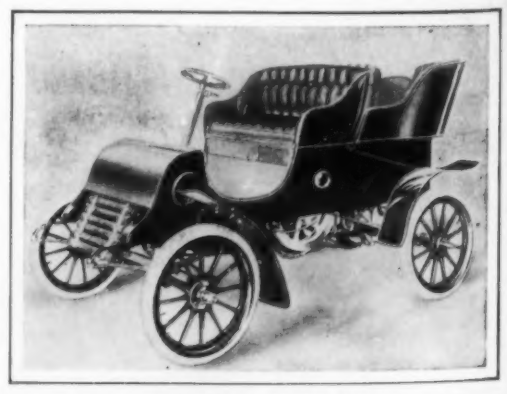
To-day Michigan produces 75 per cent of all the automobiles built in America. Why, one wonders! What should be in that Detroit that it should smell more of gasoline than Indianapolis or Cleveland or Toledo or Buffalo or Syracuse or Bridgeport or Springfield? No rubber grows in Michigan. They make no great amount of fine steel or copper there. Their own ores are scooped out of their own mines and floated away on their own lakes and rivers to be manufactured at distant points, from which they must import them like a foreign product.

If it is answered that Detroit has the advantage of water transportation, so has Cleveland; or that it is near the center of the sphere of consumption, why, Indianapolis is still nearer that center.

Do they build better cars in Michigan? I do not believe it. Nor is it because automobile manufacture started first in Michigan. What, then, is the reason for Michigan's present fecundity?

My theory is that it was first a matter of psychology—the result of a state of mind—of a constellation of inventive, industrial, and commercial stars that singly and in groups broke out in this particular section of the manufacturing heavens at about the same time—a situation in which the interest of one mind appears to have excited the interest of others; the heat of one brain to strike sparks from other brains, and these acted and reacted upon each other until more practical designs for motor vehicles were forged and more practicable schemes for selling them devised by Michigan than in all the rest of the country, and this, too, during the decisive period of the industry.

In Syracuse John Wilkinson had built a motor car in which he aimed particularly at riding comfort. In 1899 Wilkinson invited H. H. Franklin, who owned a die-casting plant, to ride downtown with him. Franklin enjoyed the ride so much that he put Wilkinson on



The Cadillac (model A) with detachable tonneau

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It is just as necessary to the tires as oil is to the bearings or gasoline to the engine. Every motorist needs one as a part of his repair outfit.

The Shaler Vulcanizer is the result of years of scientific research for a simple method to make perfect repairs on pneumatic tires by vulcanization. After many years of experimenting the Shaler principle is admittted by experienced tire men, garage men and motorists to be thoroughly efficient, practical and correct.

The Shaler Vulcanizer is recognized as standard. In the big garages and best repair shops throughout the country you will always see Shaler Vulcanizers in use.

We are the world's largest makers of vulcanizers and make the only complete line from the small outfit for the motorist to carry in his tool kit to the large garage equipment.

We make Shaler Vulcanizers in every type —Electric, Steam, Gasoline, and Alcohol. Shaler Vul-Kit (Gasoline) at $3.50—Model D (operates from Electric light socket) $12.50—Model S (Steam) $12.50. Complete Garage Outfit (Electric or Steam) $60.

Needs No Watching — No Regulating — Heat Control is Automatic

SHALER Vul-Kit $3.50

Can be carried in the tool box for emergency repairs to tubes and casings. Does away with patches and cement. Absolutely safe. Burns gasoline or alcohol —an exclusive Shaler feature. No watching, no regulating; simply fill the cut or puncture with new rubber, clamp on the vulcanizer—fill and light the generator. You can't overcure or undercure a repair. Handle always cool. Anyone can use it. Complete, $3.50

To vulcanize a tire with a Shaler Vulcanizer is simplicity itself Fill the hole with new rubber—clamp on the vulcanizer Apply the heat, and the repair is completed in a few minutes. It requires no watching or regulating. No need to worry about overcuring or undercuring because the Shaler has automatic heat control—the only vulcanizer made with this feature.

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City..... State.....
Do you sell accessories?.....
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From whom do you buy your Auto Supplies?.....

Henry B. Joy of the Packard Motor Car Co.

the pay roll of his die-casting concern to build motor cars. The first commercial output was in 1902, when thirteen vehicles were made.

Viewing the Atlantic Coast region by itself, one is impressed with the idea that it played only a small part in the early commercial development of the automobile industry. This seems all the stranger when one recalls that the first gasoline car in America was designed and built in Springfield, Mass., and the first corporation organized to manufacture automobiles in America was the Duryea Motor Wagon Company, while the Clark brothers at Ardmore, Pa., turned out the first gasoline car in 1897 and have been building the Autocar there ever since; yet the explanation is clear. The times of the Duryea Motor Wagon Company were really too early for commercial success. Its failure in part explains why the major energies of the East in early years were devoted to the steam or electric vehicle, and why the gasoline procession moved off.

Cleveland, for instance, is a city with a large element of conservative, well-to-do, comfort-loving people. The automobiles built in Cleveland partake of their environment. They are well-to-do, comfort-giving cars.

Indiana is another case in point. Indiana people have imagination and individuality. The cars built in Indiana are of every variety—Stutz, Marmon, National, Premier, Haynes, Apperson, Cole. High-priced toys of millionaires, solidly built vehicles for people who want fair service at fair prices, and low-figured, practical vehicles for the commonest of common people are all produced in Indiana.

One of the things for which Indiana automobile manufacture is most distinctive is speed. This is because a group of old bicycle racing men happened to get into automobile manufacture in Indiana. In Michigan, however, it is the commercial and practical instinct which has dominated.

Down in Warren, Ohio, was Colonel J. W. Packard, a manufacturer of lighting fixtures. Packard bought one of Winton's very early cars, and after a few turns in it decided that he could make a better one, and started to do so. The result was a rather classy-looking phaeton which steered with a thing like a spade handle. When Henry Joy failed to get that "next car" of Ford's because it was never built, he solaced himself with a Packard spade-handled phaeton. A few rides in it and Joy broke out all over with the motor-car measles. He was a man of money and of money connections. He had mechanical genius and unbounded enthusiasms. As the car he knew about was the Packard, he decided to organize a company to make that car on a large scale and to build his factory in Detroit. Packard agreed to sell out his other business interests, and come to Detroit and run the new factory. Joy let his rich friends in with him to the tune of some $400,000. They built the factory, got it ready to run, and lo! Packard found he couldn't come to Detroit at all. Somebody had to put the thing over. Every director pointed his finger at Joy.

The Battle of the Steamers

SO JOY became the directing head of the Packard works. At the end of the first season he had manufactured 200 cars and his concern had lost $200,000. Joy proposed the next year to make 400 cars.

"And lose $400,000!" snarled one of the directors. "No. I am done."

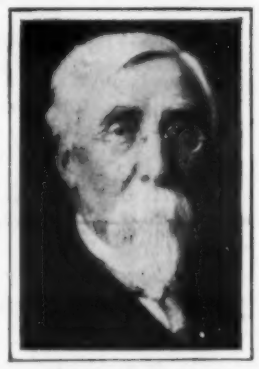
The other directors joined in taking up the stock of the director who was done, and the enterprise went on; yet before the turn was reached Joy had the names of his fellow directors on paper to the extent of $2,000,000, and the people of Detroit were referring sneeringly to the great pile of brick buildings growing along the railroad tracks to the north of the city as "the millionaire's folly."

But times have changed in Detroit, and they do not call this plant a folly any more.

One might also instance the case of Buick, who was a plumber's supply dealer in Detroit. Those were the days when a few thousand dollars and a few months of monkeying with the automobile buzz saw might set a man upon the highway to enduring fame and fortune, or hurl him over the side rails into a heap of hopeless wreckage.

In Buick's case his vehicle not only launched itself upon a career of high initial velocity, but developed an individuality which refused to be swallowed up in the General Motors merger and pushes itself sturdily farther and farther into the fabric of our country life.

Another factor in Michigan success was what has been called the Olds school. Out from the Olds factory and from the concerns which made their first entry into the business by making parts for Olds flowed a stream of automobile builders. Sometimes these adventurous young men went no farther than the first vacant lot before setting up their competition. Sometimes, too, they failed ridiculously. But some of them succeeded enormously.



H. M. Leland of the Cadillac Motor Car Co.

J. D. Maxwell was one of the most important graduates of this Olds school. Barney Everitt, who in 1901 was furnishing upholstering and trimmings for Olds's first car, was now with the Wayne Auto Company. Later Everitt and Metzger merged forces with a factory manager from the Ford Company named Flanders. Thus was born the E-M-F Company.

Following the lead of the bicycle men, the wagon and carriage builders came trailing into the industry. As early as 1902 the Mitchell Wagon concern was turning to automobile manufacture, while the first attempt at "trustifying" the industry was made by Durant, the carriage man who in the General Motors of 1909 gathered in some six or eight different concerns, among them the Cadillac and Buick.

But it was not until 1911 that the Studebaker Bros. Corporation, greatest of all the vehicle makers, took a hand. This firm brought to the industry a lifetime experience in vehicle building and vehicle manufacture for consumers in all parts of the world; and it is significant of their own conviction that in a commercial sense standardization of the motor car had been attained when, instead of gathering designs and endeavoring to launch an infant creation of their own, they boldly bought an established car—the E-M-F, of which I have just spoken—put their own name upon it and the guaranty of their widely known business integrity behind it.

Thus the present great Studebaker interest in the automobile industry is itself, in a very real sense, a descendant of the Olds school.

It was during this period of great commercial development of the gasoline car that the spectacular "battle of the steamers" came to an end. The steam automobile, as we have seen, is at least a century old; but the story of its vigorous and exciting contest with the gasoline automobile is confined to little more than a decade, and practically began when F. E. Stanley of Newton, Mass., saw an electric carriage at a fair at Brockton, Mass., in October, 1896. Mr. Stanley did not think much of the performance of the electric vehicle and had a notion he could make a better one. Just to satisfy himself, he began to design and build a car for which steam was chosen as the motive power. In April of 1897 Stanley had this car running about the streets of Newton and people were wanting to buy it.

While Mr. Stanley's interest had been merely mechanical at first, he possessed too much Yankee thrift to let a money-making idea go to waste, so he and his twin brother, F. O. Stanley, began to build steam cars and sell them, turning out four or five in that same year and continuing to build upon orders till the latter part of 1898, when they somehow got courage enough to lay down the frames and parts for 200 cars all at once and all alike. This probably confers upon Stanley Brothers the credit for the first manufacture of automobiles upon a wholesale basis, either in America or the world.

About this time John Brisben Walker of the "Cosmopolitan Magazine" was seized of a desire to go into the industry, and mistakenly espoused the cause of the steamer. He bought out the Stanley steam car and later sold part of his holding to Amsi L. Barber. The two soon separated, the Walker interests turning out a steamer called the Mobile, while Barber called his vehicle the Locomobile. When steam fell into disuse, this latter company became the progenitor of the present race of gasoline cars called Locomobiles.

Makers and Merchants

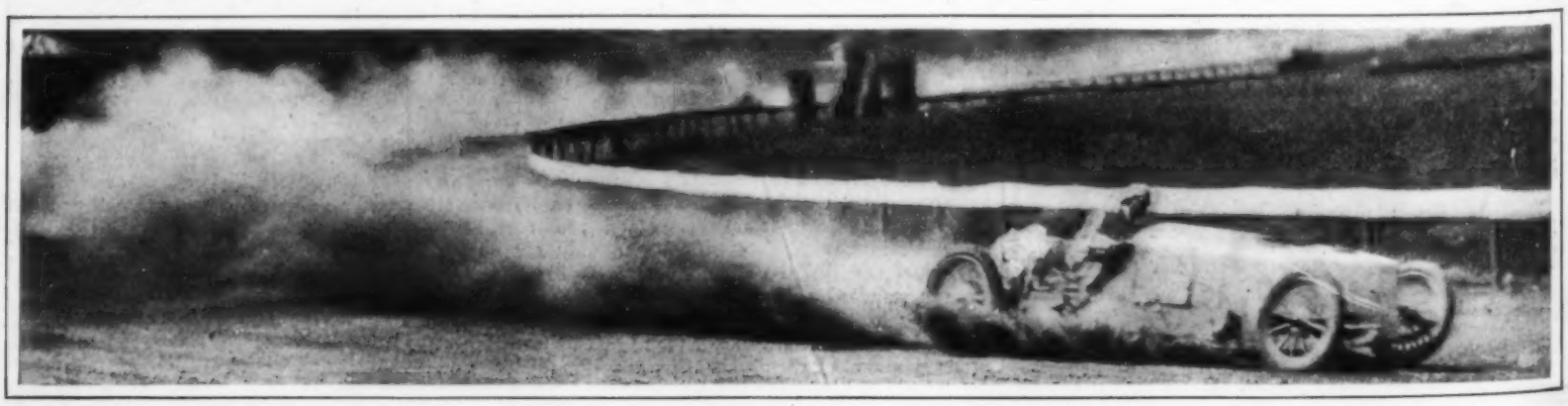
AFTER the Walker and Barber interests had sagged, the Stanleys resumed manufacture of their own cars; but the credit for the heroic last ditch battle of the steamer against the gasoline car must go in large part to those sturdy and aggressive builders, the Whites of Cleveland. They entered the field with a steam car in 1900. In the endurance run in 1901 from New York to Rochester, four of the White machines distinguished themselves. This for a car but a year old was in itself an achievement. But the cars not only demonstrated power and speed. They proved exceedingly dependable. The Whites were pioneers in the now delightful art of automobile touring. They designed a "touring body" that combined many comforts and conveniences and became a model for other makers. Cars were sent out on pathfinding trips; maps were made and route books published which in some part became the forerunners of the splendid automobile Baedekers of our own time.

But the gas engine was more and more demonstrating its supreme adaptability to the automobile, and the valiant fight of the steam machines proved hopeless. One steam manufacturer after another fell by the wayside or turned to gasoline. At length only the Whites and the Stanleys remained. In 1909 the Whites bowed to the inevitable and appeared in the lists with the gasoline machine, which speedily earned a standing of its own, while in 1910 it was noticed the "steamer" had disappeared from their catalogues. It is a matter of interest, however, that a few steam cars continued to be made each year by the Stanleys, mainly for old customers who are so well satisfied with the performances of the steamers that they refused utterly to be turned from them to either gasoline or electric vehicles.

James Couzens, Henry Ford's coworker

But now we are ready to note the last great transition in the development of the automobile industry and the rise of an entirely new dynasty—the dynasty of merchants. First came the inventors, then the practical car builders, next the great manufacturing geniuses of whom Ford stands easily first, and, last, the great *merchandisers* of the automobile. Perhaps this development can be traced most entertainingly by beginning with an exceedingly smooth young man named Chapin, who, at the tender age of twenty-six years, graduated from the Olds Works—the Olds school again—determined to become a motor magnate upon his own account.

Chapin had salesmanship, ambition, some good connections and not much else, save one very important

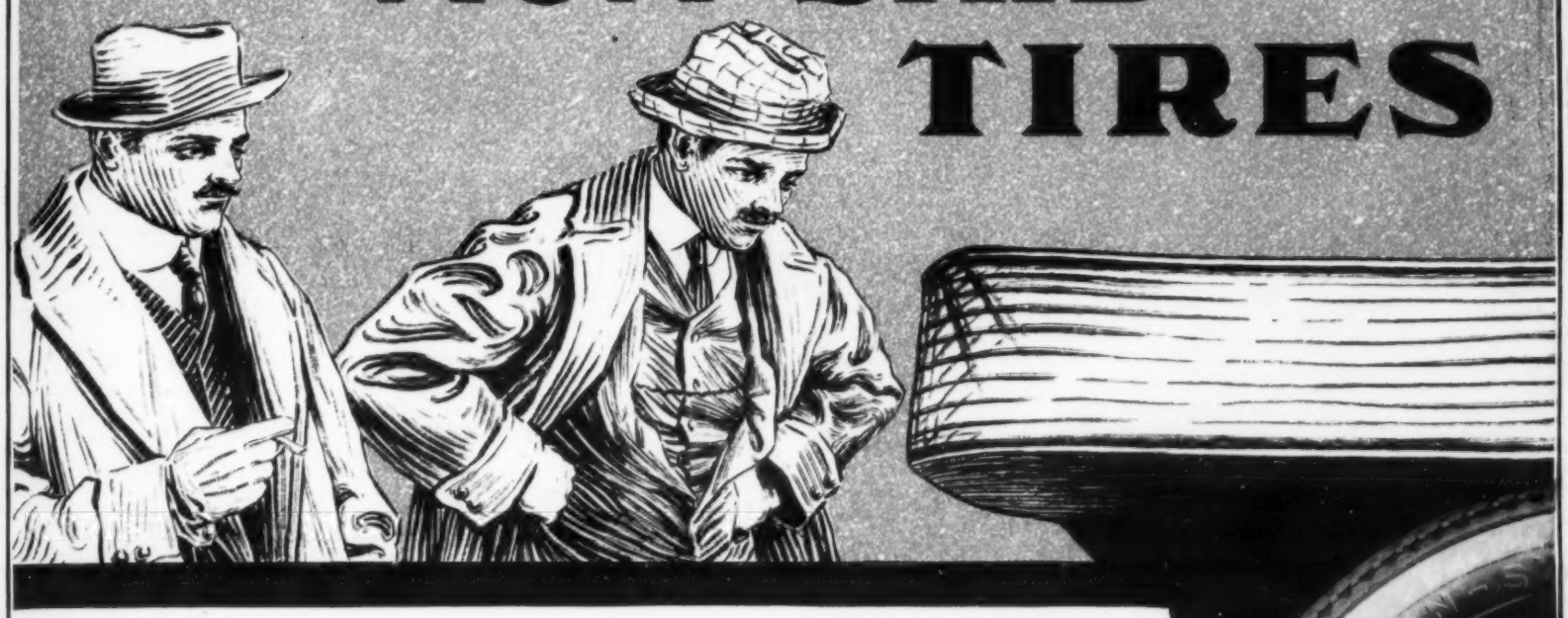


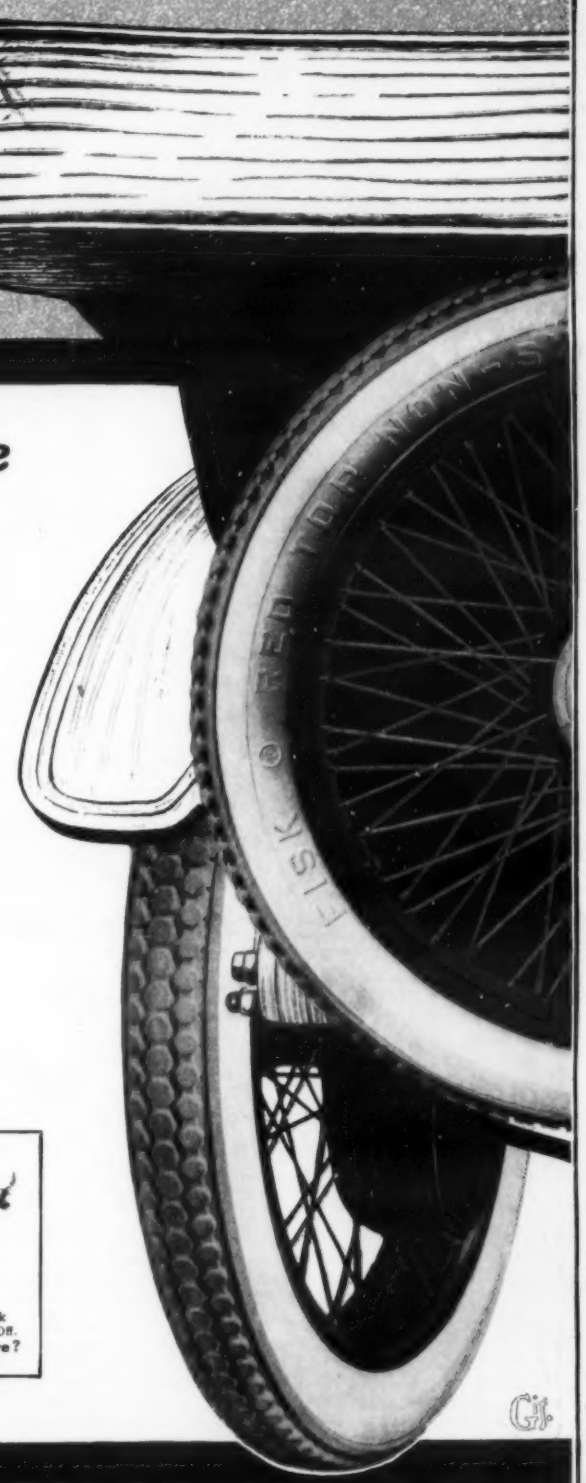
Whistling Billy, the famous White steam racer, setting the one-mile track record at Morris Park, N. Y., in 1905

FISK

RED TOP
TRADE MARK

NON-SKID TIRES





Something New—Strikingly Distinctive

This Fisk "RED TOP"

Made in Many Sizes and All Types

FOR the first time in the history of tire making appearance has been given its rightful share of attention. The result is the Fisk "Red Top"—the wonderfully attractive tire with the white sidewall and pleasing red non-skid tread—which adds the note of completeness to the finely appointed limousine or lends distinction to the most modest car.

The Fisk "Red Top" is an exclusive product—entirely different in design from any other. It is the stamp of quality in tire equipment.

The "Red Top" is as good as it looks. Its attractiveness, strong traction tread and returns of extra mileage make this tire most desirable from every point of view.

Ask your dealer for the new Fisk "Red Top" with the attractive red non-skid tread and the white sidewall.

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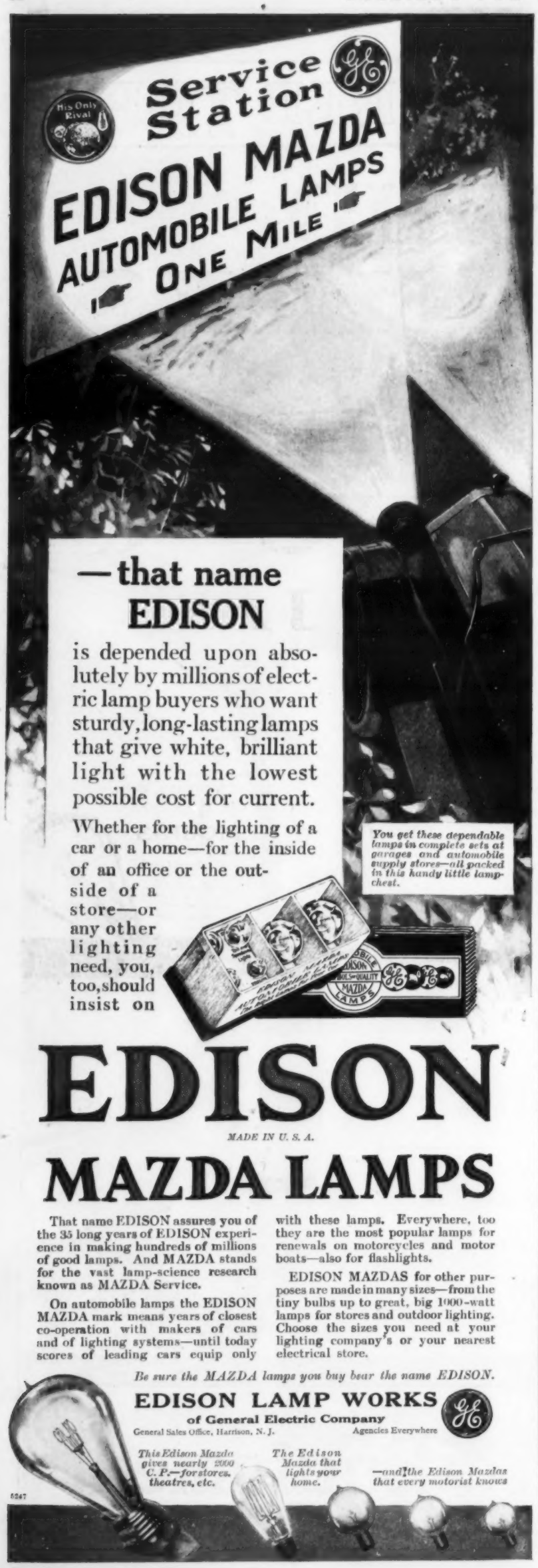
Factory and Home Office **Chicopee Falls, Mass.**

Fisk Branches in 46 Principal Cities

Finality in Tire Equipment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His Only Rival
EDISON MAZDA
AUTOMOBILE LAMPS
ONE MILE
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EDISON
is depended upon absolutely by millions of electric lamp buyers who want sturdy, long-lasting lamps that give white, brilliant light with the lowest possible cost for current.
Whether for the lighting of a car or a home—for the inside of an office or the outside of a store—or any other lighting need, you, too, should insist on
You get these dependable lamps in complete sets at garages and automobile supply stores—all packed in this handy little lamp-chest.
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That name EDISON assures you of the 35 long years of EDISON experience in making hundreds of millions of good lamps. And MAZDA stands for the vast lamp-science research known as MAZDA Service.
On automobile lamps the EDISON MAZDA mark means years of closest co-operation with makers of cars and of lighting systems—until today scores of leading cars equip only with these lamps. Everywhere, too they are the most popular lamps for renewals on motorcycles and motor boats—also for flashlights.
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Be sure the MAZDA lamps you buy bear the name EDISON.
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This Edison Mazda gives nearly 2000 C. P.—for stores, theatres, etc.
The Edison Mazda that lights your home.
—and the Edison Mazdas that every motorist knows
5247

asset in the way of an intimate associate named Howard Coffin, an engineer who is also of the Olds school. The price of automobiles had continually tended upward, but these two boys had the idea of a car of medium cost in mind, and thought they knew how to make it. However, by this time, 1906, scores of men were building practical cars. The big question from now on would be the selling question. Chapin thought if he could form an alliance with E. R. Thomas of Buffalo and get the Thomas selling organization to put in his car of lower price along with the high-powered Buffalo product he would have a money-making outlet for his energies and Coffin's designing genius.

Thus Thomas Triumphed

THOMAS by this time was resting. He had started in Buffalo in 1899 with $80,000 in cash, and now, after seven years, his automobile business had carried his name around the world and he had money in all his pockets.

Chapin followed Thomas to California and made a deal with him to build a middle-priced car in Detroit to be called the Thomas-Detroit on a model to be supplied by Howard Coffin. Thomas was to put up $150,000 in cash, Coffin was to contribute the design, and Chapin was to contribute himself. F. O. Bezner, another prize pupil of the Olds school, went along. The year demonstrated the sagacity of Chapin and of all concerned. The Thomas selling organization absorbed 500 of the new cars. The Thomas-Detroit Company piled up aggregate sales of $1,000,000, and thus broke all records for a first year's business.

For the next year Chapin and Thomas decided upon great expansion—but it was to be an expansion of the selling idea. The first consideration was not more factory space or more material, nor even more money. It was more selling power. Now, down at Dayton, Ohio, was what was then considered the greatest aggregation of selling brains in the country. They nestled under the dome of one Hugh Chalmers. Chalmers had been in charge of distribution for the National Cash Register Company, where his salary and emoluments were netting him $72,000 a year; but he was dissatisfied and preparing to leave. Thomas had first tried to lure him to Buffalo with a guaranty of $72,000 a year to sell Thomas cars, but Chalmers had declined the offer.

"You can't figure out a salary large enough to get me to work for E. R. Thomas," was his explanation. "From this on the man I work for is Hugh Chalmers."

In Indianapolis

HAVING this experience in mind, Chapin and Thomas proceeded to enlist the services of the Dayton man in the Thomas-Detroit enterprise on a contract, the chief financial consideration of which was that Chalmers worked for Chalmers. After the Thomas-Detroit had become the Chalmers-Detroit, and new successes were being won rather easily, it became apparent that the organization had rather a surplus of selling talent. Accordingly Chapin and Coffin kissed Chalmers an affectionate good-by and went out to crank up a car of their own. Being designed by Coffin, it should have been called the Coffin car, but who in time would want to ride in or own a vehicle of that suggestive name? So they called it the Hudson, and out of it have made money enough to again demonstrate that the era of merchandising the automobile was supremely at hand.

However, in that very year when Chalmers was going to work for Chalmers, another important figure was stepping across the threshold of the industry. Perhaps I should write it, *stumbling* "across the threshold," for this last and, as a merchant, greatest of them all, was a victim of circumstances. He had no idea of being a manufacturer of automobiles. He had only an idea of selling them. He was a salesman, a wholesaling sort of salesman, as will be seen when it is recorded that away back in 1907 he had sold some five hundred Overland automobiles before they were off the blue prints, and to be sure of getting his cars had accepted the deposits of his dealers and put them up with the factory. As a matter of fact, in this transaction John North Willys, who is the merchant of whom I am talking, was pretty well stretched over a barrel. He did not realize this, however, until he discovered one Sunday, right in the middle of the panic of that year, that the factory had spent all its own money and all his money—his customers' money that was—and that the 500 cars were not only by no means finished, but there was small prospect that they ever would be finished, since the concern had passed its pay roll on Saturday and was headed straight for the receiver's hands on Monday.

"How much will it take to meet the balance of the pay roll and keep the factory out of the hands of a receiver for to-morrow, Monday?" was the young man's anxious inquiry.

"Four hundred and fifty dollars," they told him. Four hundred and fifty? And the factory was going to pot for just four hundred and fifty! Shucks! John could raise four hundred and fifty by just vest-pocket borrowings among his acquaintances in the town of Indianapolis. He made the borrow and the factory kept open Monday. For John it was a busy Monday, but he raised enough to keep the factory open Tuesday, and every other day thereafter he got somehow the means to open the doors next morning and to keep on turning out cars, so he could keep faith with his dealers and they with their public—for John North Willys was a salesman, you understand, and not a manufacturer. He became a manufacturer in order to have something to sell. To this day he works backward. He doesn't make something and then sell it. He sells something and then makes it.

The Willys Way

SOON his sales agency was selling cars faster than John's equipment could turn them out, but—*where there's a Willys there's a way!* The way was a couple of circus tents. In these tents the extra cars were made; but for the next season a new factory had to be built. Willys started to New York to get the money to build it, but on the train remembered something he had heard—that the Pope-Toledo plant at Toledo was for sale. He stepped off the train at Toledo and saw the plant. It was serviceable. There was money in the Toledo banks, and just as good money as in Wall Street. John also saw the Toledo bankers. That Pope-Toledo plant was an old story with the bankers. Again and again had their civic pride and their self-interest been appealed to by proposals of sundry and various to open the doors of that plant and put all its pay rolls to dispensing prosperity; but John North Willys, smiling, confident, insistent when he plumped down before their loan desks, somehow seemed different from the ordinary automobilious adventurer. He wasn't exactly an experiment. He had a record of achievement behind him that was short but startling; it was also convincing. Besides, by now he had a nice little lot of money of his own, mayhap a half million, that he was willing to bet on himself and the old Toledo plant; and consequently the bankers felt a little less like "angels" when they took his notes for a quarter of a million or so and thereby put the cash into his hand which was to launch the Willys-Overland factory of Toledo, one of the most remarkable industrial enterprises of our times—a concern whose walls have never stopped building and in which production has jumped from 12,000 cars the first year to 50,000 in 1914, while 75,000 are proposed for 1915, and because of all of which John North Willys stands to-day the most conspicuously successful merchandiser of automobiles in the world. He has made his mark upon the industry. His shadow falls in many places. He is, of course, more than a salesman. He has organizing talent of a high order—but he is supremely a salesman, a manufacturing Cyclops, because he is a Brobdingnagian merchandiser. He is a man of ideas also, but not too many. In the automobile industry, as in some other places, woe appears to betide the man who has too many ideas.

Enter H. Ford

AND now—pausing for a final survey of the field—it is a long way from Henry Ford and his old steam mowing machine to Henry Ford making 200,000 cars a year—a long way from George B. Seiden seeking a patent on a car he has not built to John North Willys selling 75,000 automobiles before their shapes are on his floors—a long way from Duryea's first gasoline phaeton to the time when the automobile is on every highway in the world, when they crunch the ice with Scott on the way to the Antarctic Pole and charge in snorting battalions upon the warring fields of Europe—yet, long as is the way, the time is short, so very short that the baby assisted into the world by the doctor in Massachusetts who answered a pros-

pective mother's call in one of the first cars sold by Duryea is not yet old enough to vote. Yes, it is a youthful industry. Yesterday there were no automobiles. The thing was unnamed. To-day it is a commonplace of the obscurest village. With its own darting swiftness the automobile has passed from a curiosity to a luxury, from a convenience to a necessity, and become in two short decades the shooting shuttle upon which modern life is woven. The automobile delivers bread and butter and parcel post and winter's coal. It hauls the bricks that build our houses. It brings the doctor on his rounds. A horseless engine puts out our fires, a horseless patrol wagon takes away the incendiary, a horseless ambulance carries the wounded tenderly, a horseless coroner's wagon bears away the dead, and a horseless hearse will take the unidentified to a nameless grave in Potter's Field. In automobiles we live and move and have our being and sometimes give it up again.

The most conspicuous manufacturing enterprise in America to-day is an automobile enterprise. The biggest "clean" fortune in the world to-day is an automobile fortune, and it was made in ten years. The farmer who owns no motor car is more hopelessly behind the times than the one without a telephone. The automobile moves the distant farmhouse into the suburbs of the town; it backs the railroad siding into the truck garden.

Trundle back this twenty-year-old motor car into its garage and you trundle back civilization for a century. The automobile is the most conspicuous feature of our times.

The automobile has made fresh air a passion and has rediscovered ozone. It makes the valleys lovely. It brings the mountains low. It races with the clouds and turns the variable landscape into a sparkling, swift-spinning panorama. It makes neighbors out of far friends and widens the dooryard to the horizon. It makes the world larger and it makes the world smaller, and entirely retakes it in the name of humanity.

NOTE

No attempt has been made in this article to tell the story of the electric vehicle, simply because it is a story in itself. The electric was not superseded as steam has been, but, on the contrary, has won a definite place for itself in the automobile world—a place to which justice could only be done in a separate article where the story of its pioneers and their respective contributions to its development could receive the attention it merits.

Staying at Home for Awhile

(Concluded from page 7)

It has published numerous State and sectional maps and laid out five transcontinental tours.

Both organizations have shown commendable energy in signposting the roads. Both have lists of officially appointed hotels—here and in Europe. The lists are not as comprehensive as they should be, and the prices are not published but given on request. For the man of modest means the less pretentious hotels should be included, and there is room for a book on the order of the General Yearbook of the Touring Club of France with its more exhaustive information.

Nor have we anything like the Guides Michelin and Continental. They are frankly publicity literature, but their reports and rates are generally reliable and they seem to have avoided the temptation to graft. Here the only touring information available beyond that supplied by the motor organizations is numerous pamphlets, brochures, and maps published by the hotel associations or by individuals under their employ. They are prettily illustrated and the itineraries described with all the enthusiasm of the energetic press agent. But convenient inns not in the scheme are overlooked, and where bad road conditions exist, they are touched on lightly.

The motorist is so imbued with the spirit of *politesse* on returning from a European tour that he cannot fail to remark the absence of the little social amenities that distinguish the manners of the continental peoples. True, our much-maligned customs inspectors are veritable Chesterfields in comparison with the Government employees of France. The latter—telephone operators and post-office employees—assume a brusque and sometimes uncivil manner with the public that is all the more noticeable in a land of constant courtesy. Hostility toward motorists at one time marked the attitude of the French peasant and workman, but it has largely disappeared—except in the slums of some of the larger cities and in the Tarantaise district of the Savoyan Alps. In England politeness is so common that one expects nothing else. But there is some feeling between motorists and bicyclists on the roads near London. The latter are called "cads on casters"—I have seen a company of them form a line across the highway and hold a train of motors in check for miles.

Motor Manners

THE Germans are not noted for good manners. But the spirit of militarism that pervades the country is reflected in the attitude of the motorists, who invariably salute each other when passing and they are more prone to offer assistance to a car in distress than the foreign tourist would expect.

The unfriendliness of the American farmer has disappeared since he has become an automobilist himself. He is more than ever a booster of good roads since the gasoline engine has become an important factor in the harvesting and transportation of his crops.

Road hogs exist in every country. But the considerate American motorist will agree with me that we have the pick of them. This is painfully apparent in the nosing and pushing for first place on the ferryboats—though there is usually room for everyone. And the disregard for the safety of others is not confined to the overtaking driver who pulls in ahead just after passing with the evident purpose of nipping off your left hub.

On my recent tour through New York and New England I observed that the driver of every second high-powered car coming in the opposite direction held the center of the road until the last possible moment. It seemed to be a sort of game in which the driver of the six-cylinder juggernaut tested his nerve by forcing his slower-going opponent to turn down into the ditch. But sometimes the opponent refuses to be intimidated, the embryo Boillot or Palma or Oldfield stretches the factor of safety and we read in the Monday "Chronicle" of an accident in which an automobile twisted itself about a telegraph pole and half a dozen people were killed through "a derangement of the steering gear."

His Majesty, the Hotel Clerk

OUR hotel clerks are very sensitive about their roads. Some of the splendid Berkshire roads were badly in need of surface repair when I drove over them last fall. When I mentioned this to a clerk at Great Barrington, I knew I had committed a social error. He raised his eyes loftily and I felt the expatriate he thought me when he assured me I was the first motorist that had ever complained about them. I was also the first person who had ever objected to a noisy room in a large caravansary at Bridgeport. The room adjoined the freight elevator. I had arrived late at night, for the reason that I am the only motorist in existence who could find his way about Great Britain and the continent for ten years and lose it driving from New Haven to Bridgeport. I asked for a quiet room. Through a restless night I dreamed that I was serving with the French artillery in the battle of the Aisne. When I paid my bill in the morning I ventured to remark that the night clerk was a humorist. The large person behind the desk distinctly resented my flippancy. But I still insist that the night clerk was a humorist.

I have seen a French landlady in Loches quite uncivil because, after dining in her hostelry, we elected to push on to Poitiers for the night. And I have had the door of an inn slammed in my face by an irate Savoyard at two in the morning of the great fête in August. But his wife afterward came down to open it. On the whole I have received so much courteous treatment here and abroad that my hotel experience balances.

There are times when we are short on manners. But we are long on scenic wonders and undeveloped possibilities. I may be thought severe in my comparisons. But it is rather to encourage future efforts than to deprecate existing conditions. The automobile is in use in America (unlike Europe) by every class. It is up to the motorist.

Let us fill our lungs and "honk" until we are heard.

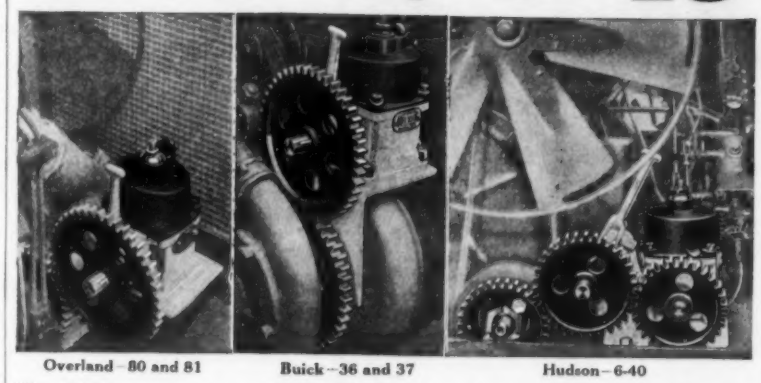
"Never Again"

TRYING to keep tires inflated with a hand-pump is an unnecessary form of violent exercise; neither can you afford to rely upon the spark plug pump or an inferior engine-driven pump. Tire manufacturers tell you that it pays you to keep your tires up to pressure. Any progressive automobile dealer, salesman or chauffeur will tell you why our tire pump is a necessary part of car equipment.

You Can Now Buy a Famous

Engine Driven KELLOGG Air Pump $15

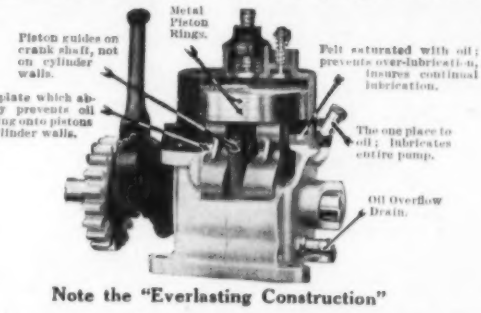
Complete with rubber tubing, air gauge and attachments carefully fitted and easily installed on your car


Overland—80 and 81 Buick—36 and 37 Hudson—6-40

The Kellogg pump, as indicated by the above illustrations, becomes a permanent part of your power plant. It is as well designed and constructed as the finest automobile engine. To inflate a tire, start pump by moving small finger lever. You stop pump when gauge shows required air pressure in tire.

The illustration below gives a clear idea of the *all-metal* construction of the pump. It is known by the trade as the pump of "everlasting construction". There are two connecting rods from drive shaft to piston. Metal piston rings. Drop forgings, bronze and finest cylinder iron are used. It has the most efficient and dependable oiling system.

We Guarantee Absolutely "No Oil Spray with the Air"


Metal Piston Rings.
Piston guides on crank shaft, not on cylinder walls.
Felt saturated with oil; prevents over-lubrication, insures continual lubrication.
Baffle plate which absolutely prevents oil splashing onto pistons and cylinder walls.
The one place to oil; lubricates entire pump.
Oil Overflow Drain.

Note the "Everlasting Construction"

Our six years' experience in building pumps has taught us to make pumps better than others might consider necessary. That is why there are more Kellogg pumps in use today than all other makes combined. Over 60,000 are serving automobile owners to their entire satisfaction, cutting down tire bills, saving the annoyance of inflating tires by hand.

The only all-metal pump that can be GUARANTEED NOT TO SPRAY OIL

We can supply you with a Kellogg pump complete with attachments for any of these cars:

Abbott-Detroit	Chalmers	Franklin	Kissel	Olds	Singer
American	Chandler	Haynes	Krit	Overland	Speedwell
Buda Motors	Cole	Hudson	Lexington	Packard	Stearns
Buick	Davis	Hupmobile	Marmon	Paige-Detroit	Studebaker
Cadillac	Elkhart	Imperial	Maxwell	Patterson	Stutz
Cartercar	Fiat	Jackson	Moon	Reo	Velie
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Remember that you do not have to wait for attachments to be made or pay extra for them.

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Give us name and model of your car and name of your dealers

Printed Matter and Special Information Free

You save time by sending $15 with this coupon. Satisfaction guaranteed or money back.

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Gentlemen:—Enclosed find $15 (check, money order, draft) for which please send me one Model 101 Air Pump complete with rubber tubing, air gauge and complete attachments ready to install on

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Name.....

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National

Parlor Car
with Adjustable Arm-Chairs

THIS new *National* Six is appropriately named, "Parlor Car." In luxury and convenience it excels the conventional type touring car as the railroad Pullman excels the day coach.

These deep, massive individual seats that are veritable arm-chairs move easily forward or back and readily turn so passengers can face each other. Aisle-way between all seats.

Built by the builders of the World's Stock Car Champion and America's record holder in 500-mile International races, this Parlor Car upholds the *National's* long record of being first. First in mechanical excellence and first in style design.

Series AB—Six, $2375
In 2, 4 and 5 Passenger Cars
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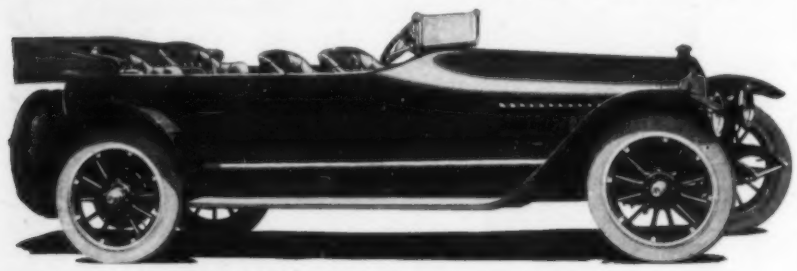


Now ready—Art Folio of new body designs. Write for a copy.

National Motor Vehicle Company, Indianapolis, Indiana

ATWATER KENT

IN little more than one year, over sixty builders of cars and engines have adopted Atwater Kent Ignition in preference to all other types. They have chosen it deliberately for the reason that **it makes their engines better.** No such general movement toward an ignition improvement has been seen of recent years.

By overcoming certain limitations once thought to be inherent in ignition, the

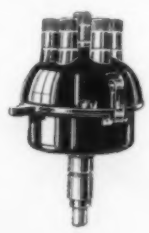
ATWATER KENT
IGNITION SYSTEM

has raised the entire level of motor performance. Cars equipped with it start quicker, "idle" more quietly, pull stronger at low speeds, accelerate better, run faster, and are far easier and pleasanter to drive.

The Atwater Kent Ignition System marks a new epoch in ignition history. The agent of any Atwater Kent-equipped car can tell you why.

Some representative Atwater Kent-equipped cars

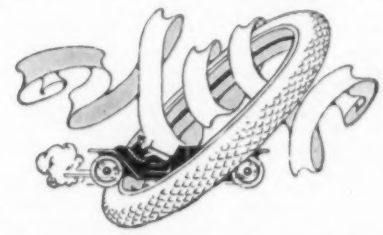
Chalmers	Imperial
Hupmobile	Saxon
Regal	King
Peerless	Enger
Paige "25"	Scripps-Booth
Velie	Partin-Palmer
Thomas	Elkhart



ATWATER KENT MFG. WORKS
4946 Stenton Avenue, Philadelphia, Pa.

TIRES

Their Use and Abuse



Some Simple Facts and Simple Rules for Automobilists Who Want to Know

By WALTER BAYUARD

DURING the year 1915 something like $250,000,000 will be spent in this country by automobile owners on pneumatic tires alone—not counting the substantial sums paid out for solid tires for commercial vehicles. It seems an incredibly large sum, and yet it represents but a fraction of the money annually spent on automobiles in the United States.

However, it is the pneumatic tire that made the modern motor car possible, and in this capacity it deserves first place in any discussion of motoring and the motor car.

There are tires and tires, and still more tires! Almost as many different qualities as there are nonskid tread designs—and that is saying a whole lot. All are made of rubber, or rather rubber is used in all of them; sometimes there is much of it, more times very little; thousands of tires of the "nameless" variety have never been nearer a chunk of real crude rubber than five miles, and still may surprise the owner by giving him good service, their entire supply of rubber being of the "reclaimed" sort. Others, made in new plants by men of little experience and according to untried methods, may actually consist of 20 per cent of the purest and finest Para gum, and yet go to pieces after 2,000 miles.

To stamp a tire on the outside "Sea Island Cotton and Up-River Para Rubber," and then sell it for $50 on the strength of that, may come about as close to obtaining money under false pretenses as the law will permit to slip by without interference.

In the manufacture of the high-class tire of to-day the materials are naturally high-grade; but so also were the materials used in the tires of nine or ten years ago. The reason a pneumatic tire of 1915 lasts from 2,000 to 3,000 miles longer than a similar sized and priced tire of 1906 is mainly the wonderful advance made in the manufacturing process. Crude rubber, it is true, is now cheaper than several years ago, but its cost was never entirely responsible for the former high price of the finished product.

To the man in the street, making automobile tires must seem the most profitable business on earth. Just think of it! One million five hundred thousand motor cars in America, and each needs at least six new tires each year! That's 9,000,000 tires at the very lowest estimate! And besides, the truck tires, motorcycle and bicycle tires, and the—well, you remember Colonel Sellers and his famous "There are millions in it, my boy, millions in it"!

Unfortunately for the tire manufacturers, there are not "millions in it!" Tires to-day are sold so close to manufacturing cost, plus a reasonable factory profit, that quantity production alone makes the business profitable.

Building a Tire

AN automobile tire consists, as nearly everybody knows, of two distinct and separate parts—the inner tube and the shoe.

The former is an endless tube of as pure rubber as can be mechanically treated and handled; the latter an exceedingly complicated product of cotton, rubber, zinc, and other ingredients intended to strengthen and preserve the product against the effects of heat, friction, oil, and other causes of deterioration.

A tire is not cast in a mold, as some people continue to believe; it is built up, layer by layer; and, like every other building, it has a foundation—in this case the fabric.

The Fabric—The first requirement of cotton fabric suitable for automobile tires is great tensile strength. The best grade of Sea Island cotton, which has a long and tough fiber, is used usually in the form of a close weave. A "weave" having from eight to twelve threads in a warp, and twenty warps to the square inch in each layer, is a good example of high-class woven fabric. Not all makers, however, use cotton weave of this type, for each has his own ideas and opinions as to the exact construction of the fabric; all of them have been remarkably successful in increasing the life of their fabrics and the tensile strength to which they can be subjected without breaking. Some manufacturers utilize a series of layers of strong cords, crossing each other "on the bias," which method has been found highly effective in producing tires that will stand very severe strains.

The Building Up—Upon the "core" (a metal form which determines the ultimate size and type of the tire to be made) is stretched a layer of the fabric saturated and coated with pure rubber.

Layer after layer of this rubber-permeated fabric is added until the desired thickness of the foundation is obtained.

Then the "bead"—the side projection which helps to hold the tire on the rim—is put on. Then the side walls are added, and finally the cushion is joined to this growing tire.

Cushion and Tread

WHEN this cushion has been closely joined to the fabric, the manufacturer has the choice of two "curing" or "vulcanizing" methods—the so-called single and double cure.

The former method consists in completing the tire and then vulcanizing and curing it. The latter cures the tire in two operations, the first of which takes place after the cushion has been added to the fabric.

The cushion attached, the body of the tire is complete. There still remain to be attached the "breaker strip" and the "tread."

The breaker strip is a comparatively new idea in tires, and has been built in chiefly for the purpose of protection against puncture through the tread, and of effecting a closer union between the cushion and the tread. The breaker strip often is permeated with puncture-resisting materials.

The Tread—Aside from great diversity in outside appearance, there is considerable difference in the inner construction of tire treads. Compounds of rubber and mineral substances they are, one and all. And it is the honesty and reputation of the manufacturer alone which guard the purchaser against worthless tires, for they can be made to look exactly alike from the outside. "Reclaimed rubber" of small resiliency, in combination with heavy mineral compounds, is used in the cheaper grades of tires, and it is poor economy to buy any but the best. Individual preferences will cause one motorist to choose a Goodyear, Goodrich, Firestone, or Fisk tire; others pin their faith to United States, Pennsylvania, Shawmut, Braender, or Portage makes; while still others prefer Ajax, Dayton, Federal, Kelly-Springfield, Lee, Batavia, Racine, Republic, Diamond, Overman, Miller, or Nassau tires. Generally speaking, the motorist is safe in purchasing these products. It behooves him to be cautious, however, when offered "factory seconds" or some type of tire bearing no name at all, but merely the dubious "34 x 4 Clincher" or

"34 x 3½ Q. D" They may last 2,500 miles—more likely, however, they will blow out after a month or so.

A Guide for Tire Using

UNDER ordinary circumstances, driving at a safe and sane rate of speed, a tire should last 5,000 miles; many will reach 6,000 and even 7,000 miles, while a few exceptionally good ones on a car driven by a careful driver will give satisfactory service for as high as 10,000 miles. It lies in the hands of every motorist to make his tires, serious and unforeseen accidents excepted, last more than 6,000 miles, if he will only remember a few very simple rules:

(1) Never drive a car unless the tires are fully inflated to the pressure recommended by the car and tire manufacturers. This pressure depends upon the load ordinarily carried. A roadster, for instance, weighing with two passengers less than 2,000 pounds, needs but a tire pressure of about seventy pounds, while a seven-passenger limousine should have its tires inflated to at least eighty pounds.

(2) If a puncture occurs, stop as quickly as possible for a repair or change of tire. Five blocks running on a "flat" tire may cause complete destruction of the shoe and severe pinching of the inner tube. The latter will result in a disastrous blow-out later on.

(3) Do not start or stop the car suddenly. Too rapid acceleration will cause the tires to spin on the ground and will subject them to much abrasion. Too severe braking which locks the wheels completely, aside from causing dangerous skids, has the same result.

(4) Do not take corners or curves at speed. Not only do you take the chance of a serious skid and a possible overturning of the car, but you subject your tires to severe side strains which might tear them off the rim.

(5) Do not drive long distances in the tracks of street cars, for the sharp metallic particles at the edge of the rail will quickly cut through your tires.

(6) Do not put an oversize tire on one rear wheel and keep a smaller tire on the other, for the difference in outer diameter will cause unnecessary strains in the differential, because the wheel with the smaller diameter will revolve faster than the other.

(7) Do not let your car stand idle for weeks or during long periods of bad weather, without raising it on jacks placed under the axles or hubs; this will relieve the tires of the strain of carrying the heavy weight of the car.

(8) The use of tire chains of the creeping type is advisable in rainy, slushy weather. Long-continued driving with chains on fairly dry roads has a destructive effect on the tires and should be avoided.

Spring Wheels and Tire Fillers—There is probably not a town or even village in this country which has not had its inventor of a spring wheel, spring tire or tire-filling substance that would "revolutionize the automobile industry."

Several thousand patents have been granted or applied for on these three "inventions." Where are they? Cast aside because of utter failure. About half a dozen types of spring wheels have been made in commercial quantities, but even these are now only used on delivery wagons of lighter type. The spring wheel is a will-o'-the-wisp, but it seems to lose nothing of its attractiveness to prospective inventors.

Why should it be a waste of time, energy, and money to develop a "resilient wheel"? Because of the following main facts in mechanics:

A small obstacle is "engulfed" by the pneumatic tire, and no shock is transmitted to the metallic or wooden parts of the wheel. In a resilient wheel, the least unevenness, the smallest pebble, causes a shock taken up by springs within the rim of the wheel or the hub; at every revolution of the wheel the entire mechanism is subjected to alternate pressure and release and every particle is in constant motion, even on the smoothest asphalt. As a result an enormous amount of labor must be performed by the built-in springs causing them to deteriorate quickly and to lose their elasticity. And with all these drawbacks the best resilient wheel cannot and does not possess the wonderful elasticity of the "loop of air" in the pneumatic tire.

When it comes to tire fillers—that is to say, to materials of spongy or feltlike construction designed to replace the compressed air cushion within the inner tube—opinion differs as to the ultimate chance of discovering something really "just as good" as air. There have been tire-filling materials since 1890, and a quarter of a century has not sufficed to produce anything noticeably better than the first crude attempts. Companies are formed on an average of once a week for the production of some such material, and a few months later disillusioned stockholders are calculating their losses.

The most promising of these tire substitutes are a certain canvas-tension tire which has been on the market about two years, and a material of French origin, called "rubber foam." The latter consists of millions of bubbles of air kept imprisoned in a foamy, spongy mass of rubber.

Many Inventions

SEMISOLID tires, too, have been proposed and some have achieved a certain degree of popularity, particularly for electric pleasure cars, as the celebrated Motz type of tire, but their usefulness is rather limited.

They have not proved successful on high-speed gasoline cars.

One of the banes of the motorist is the "inventor" of so-called safety valves for tires. Theoretically the idea is fine—the trouble is, it does not work well in practice! If, for instance, a "safety valve" is set for 75 pounds and the car stands for a length of time in the hot sun, the air in the tire is heated and expands. The safety valve opens and permits a considerable amount to escape.

The car later on is moved or the sun sinks behind some house or tree—the air in the tire cools and contracts and the pressure falls, perhaps as low as 50 pounds. As a result the tire is run flat, and trouble is due for Mr. Motorist.

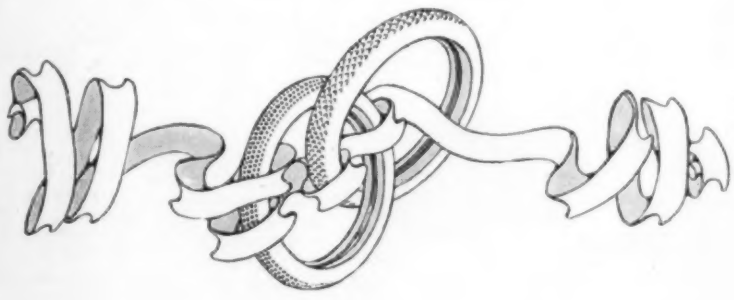
It may be of interest here to add that after a tire has been in use for several months without a puncture and has been inflated a few times to the pressure limit, it contains almost pure nitrogen. The oxygen in the air escapes between the molecules of rubber, while nitrogen is retained. As nitrogen is an inert gas, its presence is greatly desirable in the inner tube.

Huge sums are invested in factories for the manufacture of automobile tires, and the industry promises to become larger and larger, owing to the ever-increasing number of automobiles in use and their greater use throughout the year. Five years ago a motorist who made a 100-mile trip considered it an achievement.

To-day transcontinental trips are made by hundreds of owner-drivers, and a total mileage of 12,000 in a year is by no means rare, as compared with 5,000 miles annually with motorists of 1910.

A Look Ahead

THAT, of course, means more and stronger tires, and it is up to the manufacturers to keep abreast of the demand. Some plants turn out 6,000 and more tires per day, and are barely able to fill their orders. The total number of automobile tires used up in America in the course of a year is probably not far short of 15,000,000—including taxicabs, delivery wagons, and motor busses. Added to this should be the 750,000 motorcycle tires and an unknown number of bicycle tires, and it will be easily understood why the tire industry of the United States ranks high in the list of manufacturing enterprises.



Give 'em air

"Tire insurance for one dollar"

Unless you have been measuring the air in your tires with a pressure gauge the chances are ten to one that you have not been giving them enough air.

Tires that have *not enough* air die a violent death.

Tires that *have* enough die of old age.

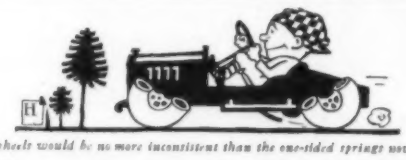
Inflate your tires to the air pressure which your tire maker prescribes. Only in this way will they give you maximum service.

The only way to *know* that you have the prescribed pressure is to measure it with a

TWITCHELL AIR GAUGE

Price One Dollar

THE TWITCHELL GAUGE CO., 1200 Michigan Ave., CHICAGO



One-sided wheels would be no more inconsistent than the one-sided springs now on your car.

The missing half of your spring equipment

See if you can reconcile these two facts about your present springs:

First—engineers know that every vibration, from the smallest jar which merely jolts you, to the biggest bump, which *breaks springs*, is felt not while the spring is straightening out, but on the recoil—the back-snap.

Second—all the reinforcing plates of your present springs are on one side—the under side—put there to cushion pressure *only on the downward swing.*

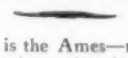
Clearly, this is effective as far as it goes—exactly *half way.*

The other half of your spring equipment is the

Ames Equalizing Spring

It is guaranteed for the life of your car—costs from $8 to $15 a pair

Here are your present leaf springs—all the reinforcing plates on *one* side—only *half* springs.



This is the Ames—merely another series of plates spaced over your present main leaf—it is the *other* half, now missing.

Here are your present springs supplemented by the Ames, now complete. They resist pressure both ways.

For Commercial Cars:

Examine your expense sheets for repairing and replacing broken springs. Then remember that an Ames installation costs less than one complete repair job. Let us estimate on your fleet.

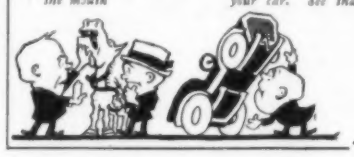
For Pleasure Cars:

Recoil alone is responsible for discomfort. It is the cause of broken springs. The Ames is easily put on to prevent these two troubles. Insist that your new car is Ames Equalized.

CLARENCE N. PEACOCK & CO., 1790 Broadway, New York

It's all very well not to look a gift horse in the mouth

—but an automobile is neither a gift nor a horse. Look carefully at the springs on your car. See that they are two-sided.



Clarence N. Peacock & Co., 1790 Broadway, New York

Gentlemen:—Please send me more information about the Ames Equalizing Spring. Yours very truly,

Name.....

Address.....

.....

FIAT

Overland

Ford
THE UNIVERSAL CAR

American Electrics

KISSELKAR

Rauch & Lang Electrics

YOU CAN DO IT WITH A REO
REO

BAKER
ELECTRICS

Stevens Duryea

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Mitchell

SPAULDING

THE Detroit ELECTRIC

Republic

1915 MOON LIGHT WEIGHT SIX-50

SGV

OHIO ELECTRICS

STANLEY

Pilot

Stearns Light Four

RICHMOND

KING

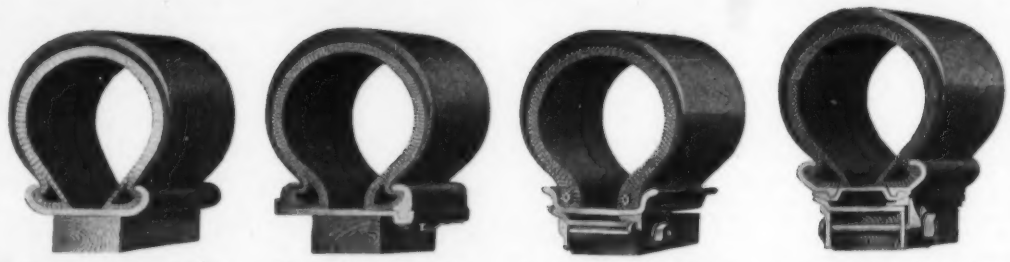
WESTCOTT MOTOR CAR CO.

Franklin

DODGE BROTHERS DETROIT U.S.A.

Woods Electrics

STANWELD PRODUCTS



Stanweld Plain Clincher Rim

The equipment used on most of the smaller types of cars. Strong, well-made, and of the best material. Our production of this one type of rim is more than one and a half million yearly.

Stanweld Number Fifty Detachable Rim

Standard equipment on most electric pleasure cars. Used on a majority of American made wire wheels. Accepts either solid or pneumatic tires. Has quick tire-changing advantages.

Stanweld Number Twenty Demountable Rim

The popular type of demountable rim. Used by more manufacturers than any other one type or make of rim. Lightest demountable rim made. Safe, quick and easy to operate.

Stanweld Number Sixty Demountable Rim

Used on the larger types of cars. The only rim which permits of access to the inside of the casing without requiring separation of the tire from the sides of the rim. Has unique tire-changing advantages.

You Should Know Every Part of the Car You Buy

THE CAR you buy will be equipped with Stanweld Rims, when you learn these facts. Stanweld Rims are made by America's first and largest rim-makers. They are made of the best material obtainable for the purpose. They are made by the most expert workmen employed in the rim-making industry. Every Stanweld Rim is tested four times—for quality of material; for accuracy; for ease and certainty of operation; and for the tire-fit, by the Tire Manufacturers Association.

This company was the first to use electric welding in a practical and successful manner. And in the years that we have been engaged in the manufacture of rims, tubing, and parts by that method, we have perfected the process up to a point where today it is recognized as one of the greatest inventions of the last two decades.

We are probably the only concern that ever has been called upon by the U. S. Government to make test material by the electric welding method.

These facts should mean this much to you: That Stanweld Rims are first of all safe rims—the safest rims made. And because you want first of all a safe car, you should insist on a car equipped with Stanweld Rims.

Literature on any or all types of Stanweld Rims will be gladly sent to anyone free of charge. A post-card is sufficient.

STANWELD SEAMLESS STEEL TUBING

If you've ever owned a bicycle, motorcycle, or automobile, you've undoubtedly owned a piece of Stanweld Steel Tubing. It is used by the world's largest manufacturer of automobiles; by the world's largest manufacturer of motorcycles; and likewise by the world's largest maker of bicycles.

Stanweld Steel Tubing is used by so many manufacturers because it has a combination of qualities rare even to good steel tubing—lightness, strength, and fine finishing qualities.

A large part of our tubing output is sold in formed parts, the department for this work being the largest of its kind in the United States, wherein we make upwards of five million separate pieces a year.

The field for steel tubing is rapidly widening. In many cases it is replacing wood, fibre, copper, brass, and expensive machined parts, giving the finished article greater strength, better appearance, and lower cost.

Although we have many large accounts we are always desirous of getting in touch with small concerns or individuals who seek to use steel tubing or tube parts.

We are able to offer a service which is exceptionally valuable because of our experience with countless difficult and intricate problems.

Correspondence is invited on any matter appertaining to steel tubing.

The Standard Welding Co.

Pioneers and World's Largest Producers of Rims for Motor-Driven Vehicles

Main Office and Factory **CLEVELAND**

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LEWIS "VI"

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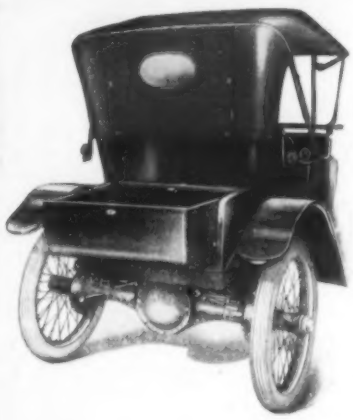
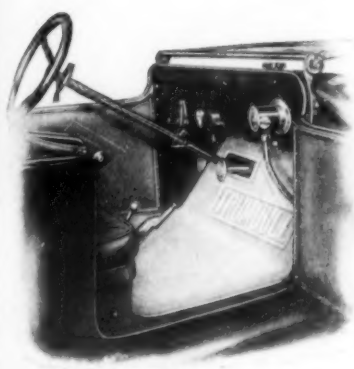
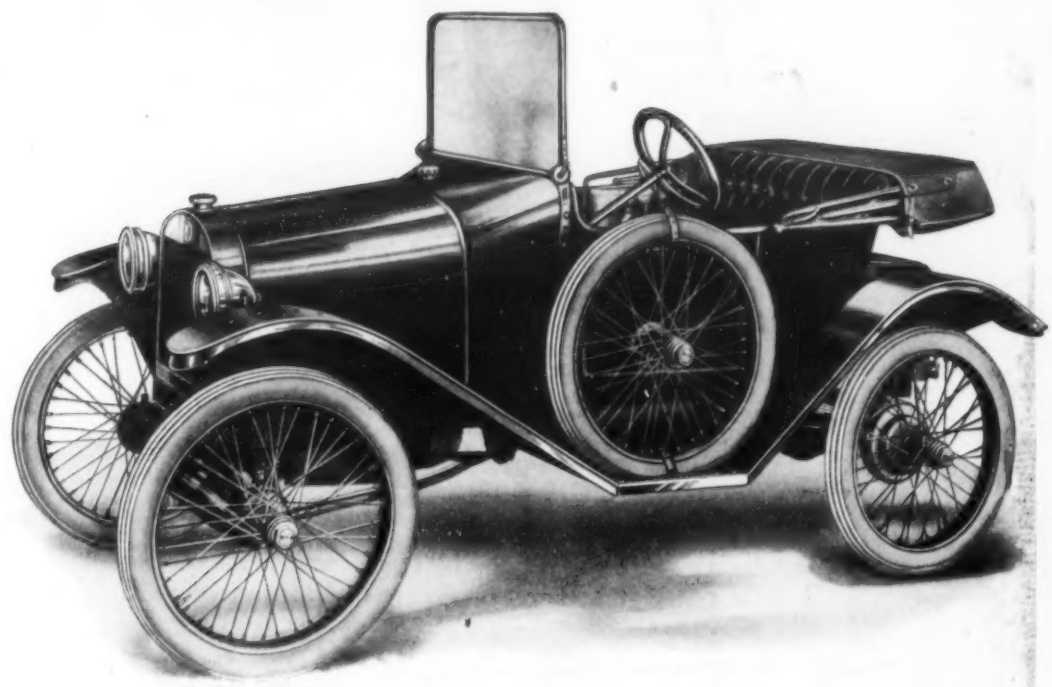






How Much? Guess!

You can buy cars as good as the Trumbull—but they cost a lot more. You can buy cars for what the Trumbull costs—but do they look like it or compare with it?

The level has been reached. The level where perfect car quality meets the lowest price.

Study the Trumbull. Study its sturdiness, its ultimate simplicity, its elegance of line and roominess, its completeness.

Here is no toy, no makeshift, no compromise.

The Trumbull is a car to fill any man with pride and satisfaction. It is built for years of consistent service. It possesses power, speed, endurance. It lacks nothing—down to the last locked bolt it is an automobile of most advanced type.

And its price—but wait!

TRUMBULL CAR

Mechanically it compares favorably with cars costing many times as much. Its parts are made on automatic machinery of absolute accuracy. All of these parts are interchangeable.

Better steel has not been tempered than goes into every part of the Trumbull.

The engine is a marvel of compact power; a four-cylinder, four-cycle, water-cooled engine with cylinders cast *en bloc*, all working parts enclosed; silent, efficient and unfailing.

Transmission is of the selective, sliding-gear type with three speeds forward and reverse. The Trumbull seats two people comfortably, with plenty of leg room. In the rear is a capacious luggage carrier. Upholstery is elegant. The top and side curtains come as regular equipment.

For further details, read specifications.

The Trumbull costs $395 complete. That is a wonderful price for the high quality of car we offer. It is a price which would have been impossible two years ago. It is a price made possible by the extraordinary development of automatic automobile machinery.

And finally—our profit is based on the idea of selling many cars at a close profit rather than a few cars at an exorbitant profit.

The Trumbull represents the most value per dollar of investment that you can find. Again, the price is $395.

TRUMBULL MOTOR CAR CO.

Bridgeport, Conn.

New York Show, Space B 20 **Chicago Show, Space No. 17, Basement**

1915 SPECIFICATIONS

MODEL 15B

MOTOR: Four-cylinder, cast *en bloc*, four-cycle, 2⅞-inch bore, 4-inch stroke; Thermo syphon, water cooled, with improved type five-tube radiator. **Horse Power**—14-18 at ordinary speed. **Lubrication**—Pump and splash. **Ignition**—High-tension magneto. **Carburetor**—Modern type with hot-air attachment; only one adjustment, float-feed type.

CLUTCH: Cone, leather faced; non-rattling brake.

TRANSMISSION: Selective sliding-gear type. Three speeds forward and reverse. Double heat-treated nickel-steel gears; annular ball bearings.

CONTROL: Left-hand drive, centre control.

AXLES: Front Axle—I-beam section, drop forged in one heat without welding. Renewable bronze bushings in steering arms. Ball bearings in hubs. **Rear Axle**—Semi-floating type. Bevel-gear drive. Hyatt roller bearings in hubs. **Brakes**—Internal and external contracting and expanding on 9-inch drums with 1¼-inch face; lined with best quality brake lining. Large and powerful, ample for much heavier car; quick adjustable.

WHEELS: Special wire detachable. Each wheel fits all hubs, front and rear.

SPRINGS: Transverse in front, cantilever springs in rear.

GASOLINE TANK: Located under cowl over dash. Capacity, 7 gallons.

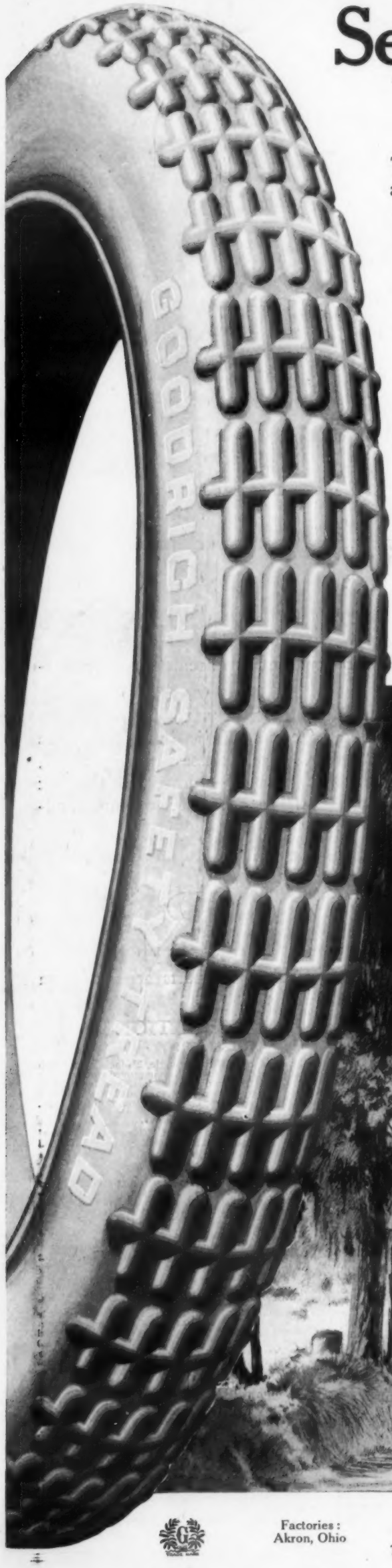
BODY: Roadster type, special stream line. Tufted upholstery, sociable seating. Large parcel compartment at rear with 200 pounds capacity. **Finish**—Standard black, nickel trimmings. (Cars will be painted in any color desired with striping to match, for $15 additional.) **Seating Capacity**—Two persons side by side. All pedals within easy reach of the operator. **Lamps**—Electric front and rear, special arrangement for dimming controlled by switch from seat. Current supplied by storage battery.

WHEEL BASE: 80 inches. Tread, 44 inches.

REGULAR EQUIPMENT: Top—with side curtain and envelope complete. **Wind Shield**—Torpedo type, adjustable; black enamel frame and nickel trimmings. **Electric Lights**—Two in front and one in rear. **Electric Horn** under hood. **Oil Gauge** on base of reservoir of motor. **Jack, Tire Pump** and **Tool Kit,** and **Storage Battery** for lighting.

SPECIAL BODIES: Regular Chassis equipped with a special type, light delivery body complete with top, and detachable side curtains. Capacity ¼ ton. $395 in prime coat of paint. **Regular Chassis** equipped with coupe body. Two-passenger, handsomely upholstered. Special finish. $600.

Write us for name of nearest dealer and complete booklet.



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